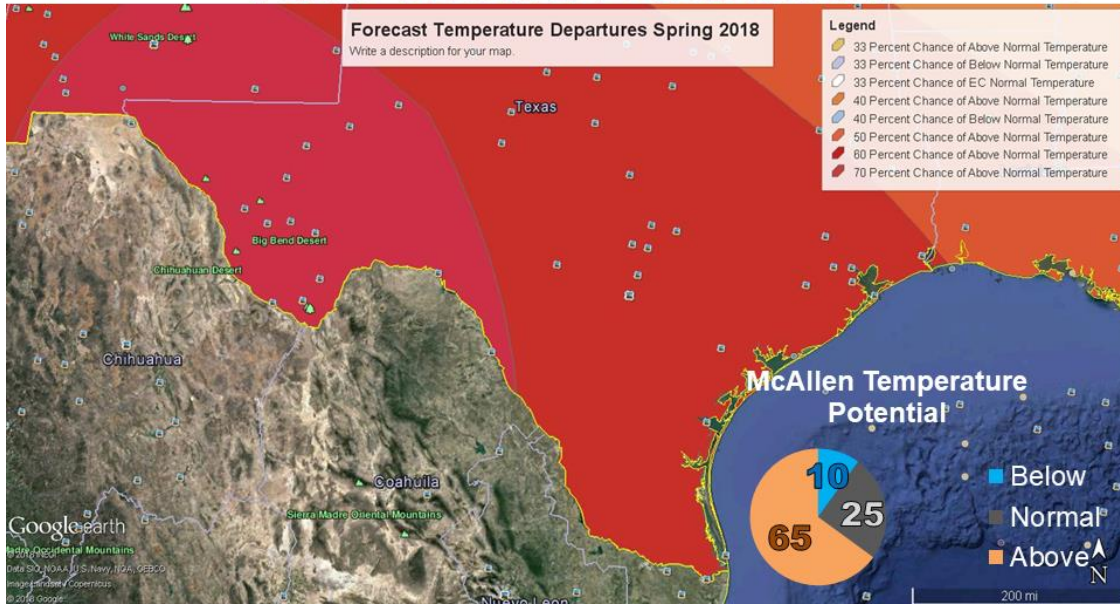




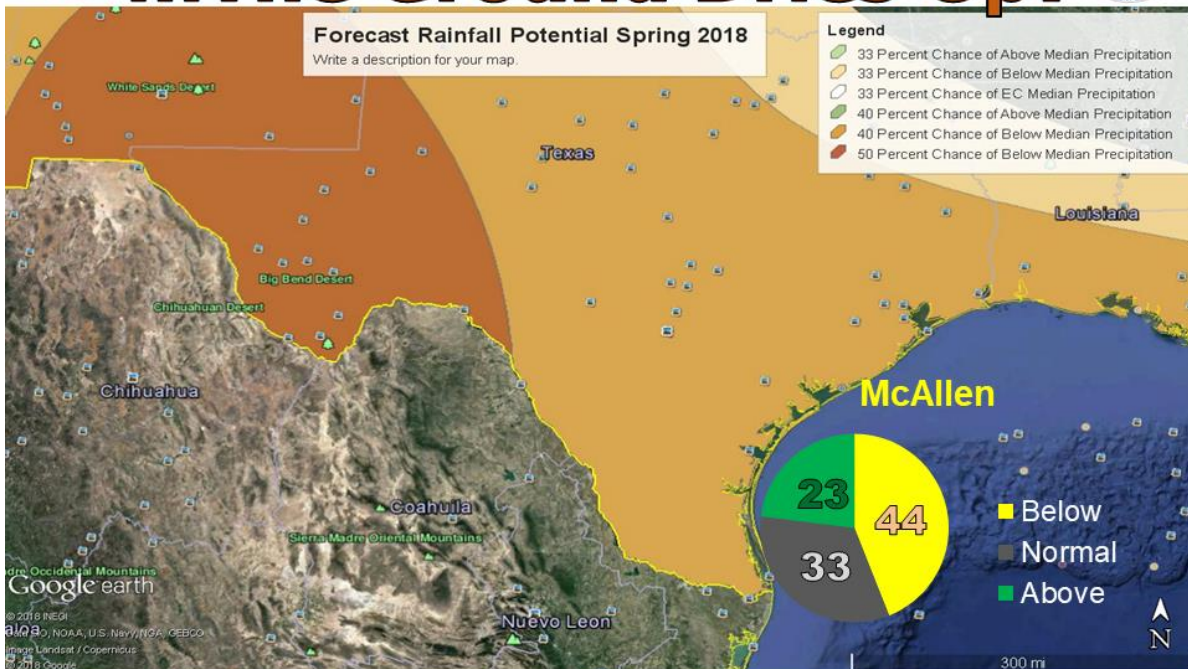
The Heat Builds...



Rio Grande Valley **Average** for March - May (based on 1981-2010)
Wake-Up Temperature: 60° Ranchlands, Mid 60s Elsewhere
Afternoon Temperature: Around 80° Beaches; Low to Mid 80s Elsewhere



...The Ground Dries Up?



Rio Grande Valley **Average** for March-May (based on 1981-2010)
Precipitation: Ranges 4 ½ inches Mid/Upper Valley to 5-6 inches Ranchlands and Lower Valley

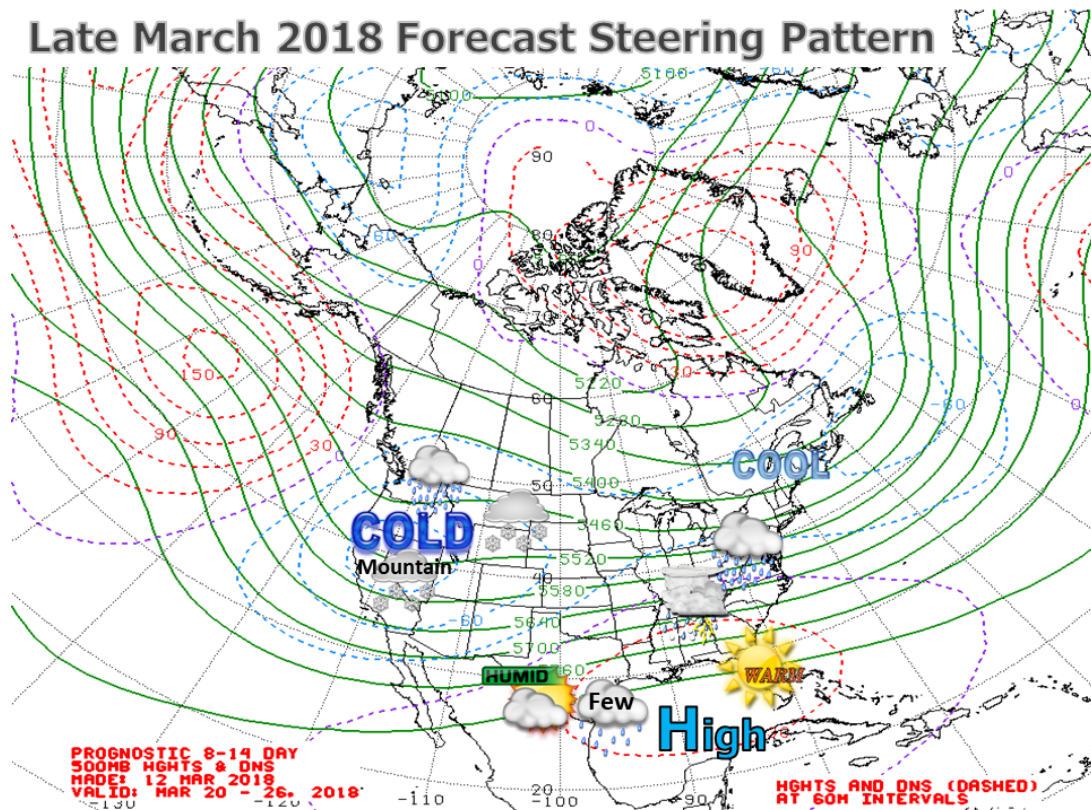
Summer in Spring? Warm February A Harbinger of Heat

Warm to Hot, Humid March May Lead to Drier, Hotter April

Overview

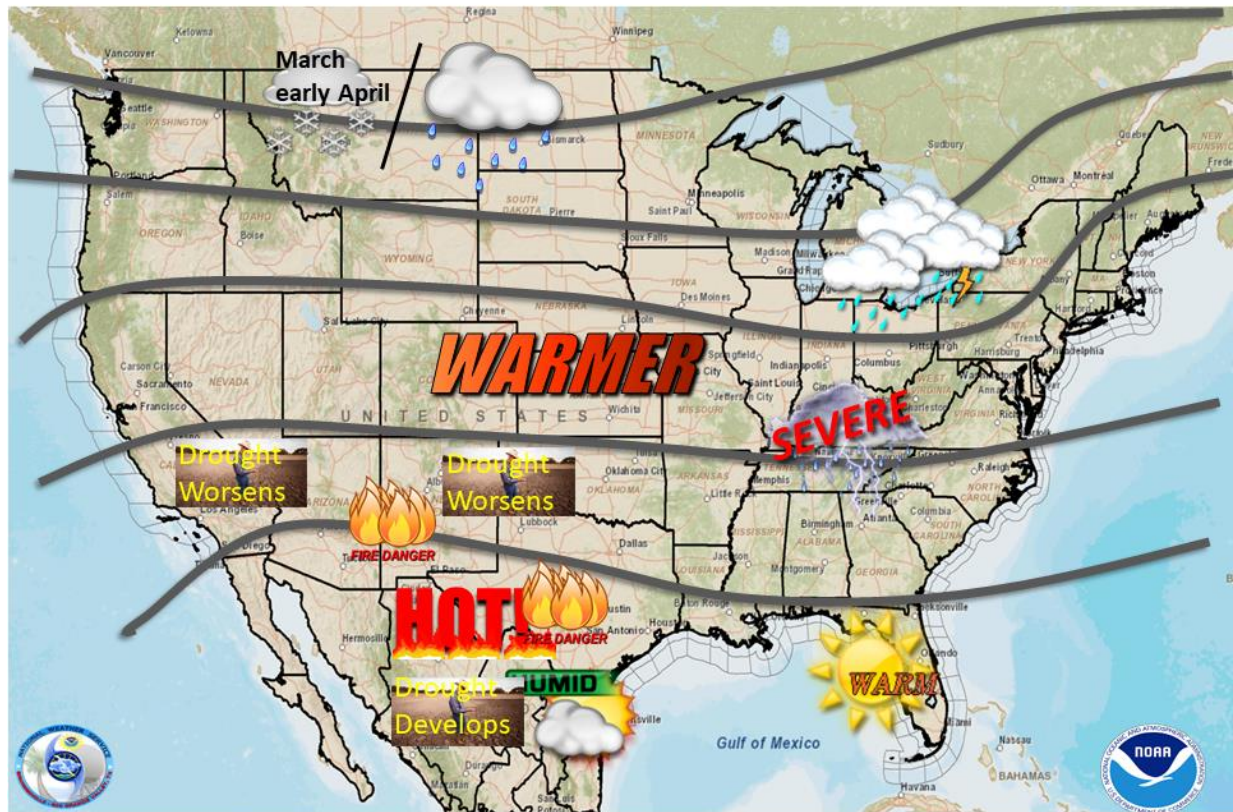
Following a topsy-turvy winter that featured eight sharp (25°F or greater day to day changes) cold snaps, more than half a dozen individual freezes in some areas, and up to three separate frozen/freezing (ice) precipitation events – but also a top ten warmest February with temperatures between 5 and 6.5°F above average that tilted the scales for winter (December-February) overall to a shade *above* average – spring, defined as March through May, began on the “hot” foot with temperatures for the first third of the month running more than 6°F above average.

After the ninth and probably final sharp change event – this time from searing hot to comfortably cool (101°F to 73°F) between the 11th and 12th – the tail end of March was showing signs of a prolonged warm to hot, but humid, time with frequent “Valley Wind Machine” events that would be tempered a bit by the upper level pattern, which was forecast to feature a flat subtropical ridge oscillating between eastern Mexico and the central Gulf of Mexico. Rainfall was expected to be light overall, with much of the forcing energy staying north to well north of the Rio Grande Valley. Still, there was an outside chance for some periodic north-south fluctuations in the pattern, which could bring additional fronts that could combine with overrunning southerly flow above the surface to produce at least one shot of showers/thunderstorms before the month ends. Should that pattern not evolve and the better forcing remain to the north, March will end drier than normal and the stage will be set for a hot and dry April, likely continuing through at least May.



Above: The atmospheric continues to show a flat subtropical ridge from the Rio Grande Valley through Florida for the last full week of March. This would favor days of southerly surface winds and warm to hot afternoons, with fresh muggy breezes overnight. A few showers could set up along any fronts that seep through the region.

Expected Steering Pattern March-May 2018



Pattern Matters

Warmer To Hotter and Drier than Average Becoming More Certain

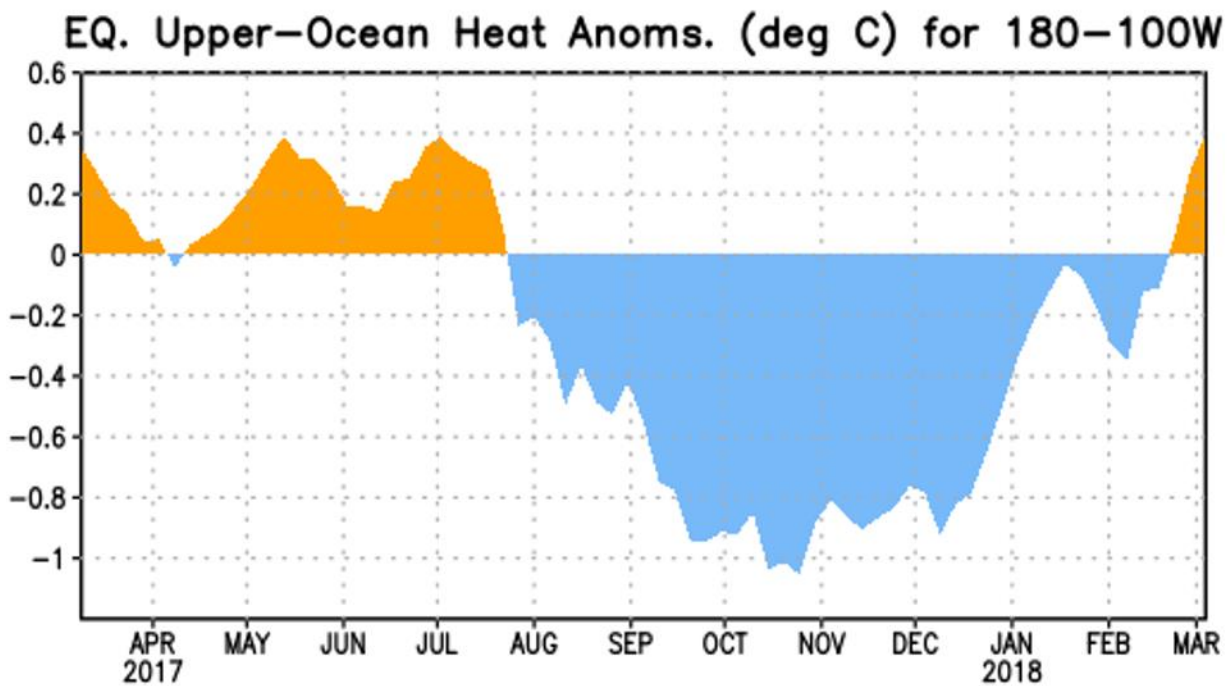
- Warm to hot days and muggy overnights will continue through March, though “heat spikes” ahead of and behind dry fronts are likely on several occasions through April and perhaps into early May
- Confidence is becoming near certain on the heat, with persistence in warm vs. cool weather (temperatures since February 1st running nearly 6°F above average) combined with persistent spring forecast trends since the *autumn* of 2017 driving the level
- Late January through the last week of February saw a pronounced moderate positive North Atlantic Oscillation (+NAO), which may have contributed to the prolonged Gulf of Mexico subtropical ridge that at once kept Florida sunny and pleasant and the Valley unusually warm, humid, with prolonged periods of the “Valley Wind Machine” that pushed the monthly average high to near 80°F and morning low into the lower 60s, more typical of March.
- Teleconnections in spring are less associated with temperature variations than they are in winter. However, there are signals that a persistently negative North Atlantic Oscillation (-NAO) through spring leans toward periods of dry “fronts” that bring low humidity and comfortable nights, but a better chance for fire danger situations emanating from rapidly worsening drought conditions.
- A seasonally positive NAO could help deepen the southerly flow, which would bring a better chance of thunderstorm systems that would produce average to even above average rainfall by aiding a spring subtropical jet.
- Uncertainty in NAO predictability increases during spring and summer.

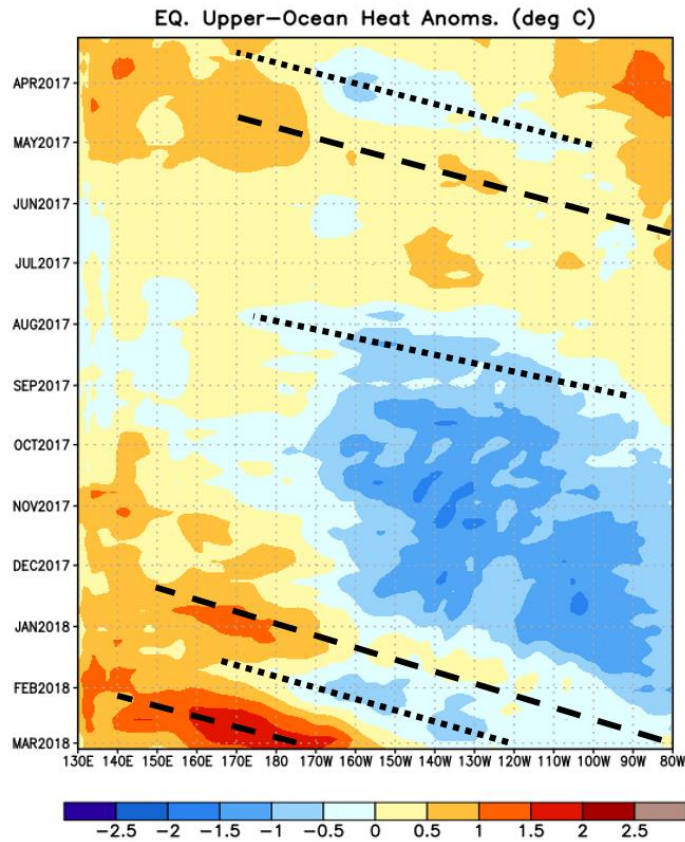
Teleconnections: *La Niña* Beginning to “Crack”

Eastern tropical Pacific water temperatures that had been dominantly cooler than average through winter, resulting in a several month period of moderate *La Niña*, began showing signs of warming by the beginning of March. A strong downwelling Kelvin Wave (below), the first since the tail end of the last weakly positive

Oceanic Niño index period in spring 2017, had formed west of the International Date Line in early March. Predictive models, however, were varied on the future of the impact on this downwelling event, with the suite of International Research Institute (IRI) dynamic models in consensus on evolution to a neutral-leaning positive ENSO ONI by late spring through summer, possibly leaning El Niño (positive phase) in autumn 2018. The U.S. Climate Forecast System model, however, holds onto a weak La Niña or neutral leaning weak La Niña pattern through spring, summer, and autumn 2018. The consensus forecast (below) shifts La Niña in spring to a neutral-leaning negative ENSO by late summer and early autumn.

The combination of weakening La Niña, a potentially -NAO, and a weakly positive Pacific-Decadal Oscillation (PDO, which would be a non-factor) would practically nail down the warm to hot and drier than average condition predicted in this outlook (first page). Should a more persistent +NAO redevelop (strong +NAO in spring is generally unlikely), the door could open to periodic subtropical jet events that could provide welcome rainfall – but all that comes with it during spring (potential wind, hail, frequent lightning, and floods). While we always recommend Valley residents to prepare for all of these possibilities in spring, the opportunities in spring 2018 appear few and far between.

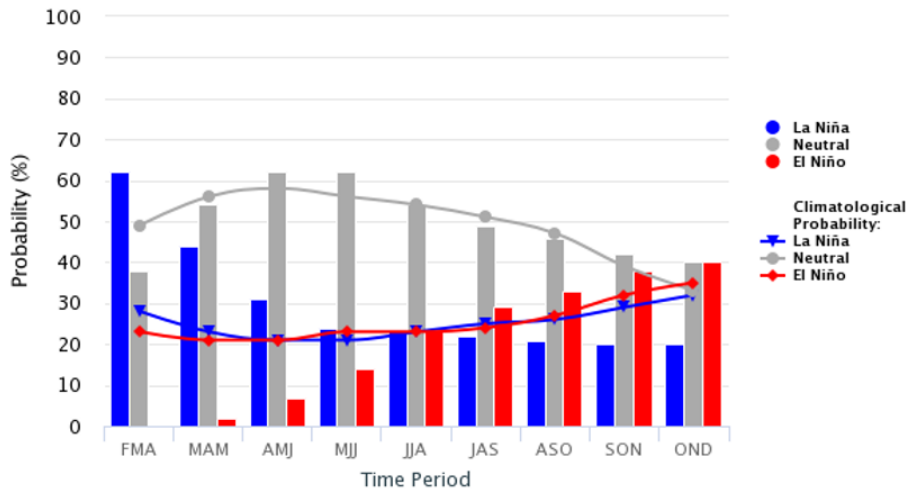




Above: *Previous Page:* Upper Oceanic heat anomalies in the ENSO 1 to 4 region, showing definite deep cooling through fall 2017 and winter 2017/2018 before a rapid rise at the end of February and early March 2018. *This page:* Large blue area matches the prolonged cooling in the figure on the previous page, but a recent fairly strong downwelling Kelvin Wave that began west of the International Dateline and progressed east since February may be the beginning of the end of the current moderate La Niña.

Early-Mar CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C



Multi-model consensus forecasts now forecast La Niña to fade quickly to neutral-leaning La Niña through spring, then neutral during the heart of summer before potentially leaning toward El Niño by mid autumn 2018.

What to Watch For: Becoming Hot, Worsening Drought, Wildfire Spread Threat Peaking

Overall, for spring 2018, the following situations are expected to predominate:

- *Hot with Limited Rainfall.* As of this writing, the first century mark readings occurred across the mid/upper Valley ahead of a mid-March comfortable front, but inland 90°F+ temperatures were expected to return by the third weekend of the month and could remain for a week or longer, ensuring March 2018 ends somewhere between 5 and 7°F above average. The potential for similar departures exists for April and perhaps May, which would ensure plenty of heat; should the upper level pattern (page 3, above) feature a dominant ridge extending from the central Gulf through northern Mexico – a preview of the “dog days” La Canícula pattern – at some point in April and May, the potential for significant rain will be shut off. That said, any embedded strong wave in northwest flow during April and May can produce memorable severe weather in the form of hail, wind, and lightning and is certainly a reasonable worse-case scenario.
- *Drought.* As of this writing, moderate drought was spreading across much of Hidalgo, western Kenedy and reaching into the South Texas Brush Country including slivers of Zapata, Jim Hogg, and Brooks. Increasing sun angle, lack of significant rain since December (and in some areas, since October), and the potential for “dry” heat bursts would both exacerbate and accelerate drought conditions across the Valley. Should the forecast be realized, widespread severe to areas of extreme drought would develop in all areas.
- *Wildfire Danger.* Fuel growth was mixed through winter, as there were pockets of good rainfall including parts of Cameron and Willacy and southeast Kenedy County, Starr County, and in early December, southern Zapata through Jim Hogg and Brooks County. However, more than a half dozen freezes in ranch country and at least three freezes in most other areas in early December and again in early and mid January 2018, as well as three freezing/frozen precipitation events, “cured” new and old growth brush. In areas with little late winter and spring rain, greenup has been minimal and the stage is set for second wave of drought “curing” into April. Dry but hot “fronts” that could bring sub-20 percent humidity and 20 to 25 mph winds would combine with the dry fuels to create a rapid to explosive wildfire growth threat, centered on April but potentially continuing into May.
- *Severe Weather?* Even in drought/dry springs, the Valley is not spared from one or two local severe storms that produce large hail, damaging winds, frequent to excessive lightning, or all three. Prime season is from late March through late May, and 2018 would be no exception. Few opportunities does not mean no opportunity.

Outlook: Remainder of Spring 2018

March began where February left off, and by the 11th much above average temperatures were well entrenched with 5 to 6.5°F on average departures across the region. A brief cooldown to a touch below average from the 13th through 14th was expected to be replaced with a 7 or longer day period of 5 to 10 degree above average conditions, locking in a much above average month for the second month in a row. Rainfall was limited and expected to remain so through at least the 20th, if not for the entire month.

April holds the key to the evolution of spring 2018. Should the upper level ridge expand west into northern Mexico while remaining rather “flat” across the central Gulf, any precipitation would be associated with passing waves to the north with little to no subtropical connection from the southwest Gulf and eastern tropical Pacific. The best Deep South Texas/Rio Grande Valley could do would be convergence along the frontal zone where sufficient moisture and instability could develop – but most fronts in this pattern would come through dry.

Should the upper ridge hold across the central and eastern Gulf, the potential for a diving wave into the southwest U.S. or north central Mexico could bring deeper tropical moisture into the fold on occasion and provide opportunity for infrequent but welcome heavy rains, along with thunderstorm “systems” that could bring a host of severe weather (hail, wind, excessive lightning, and localized floods). There remains some uncertainty – enough to keep the idea on the “back burner” despite increasing confidence in the drier and

hotter solution. Regardless of the final pattern, frequent 90+ degree days and many nights with temperatures failing to fall below 70 would dominate; in the drier pattern, at least five days could reach 100°F or higher along and west of US 281/IH 69C.

May would follow April's lead, with the higher sun angle and continued warming atmosphere leading to most, if not all, afternoons reaching 90 and a sizable number reaching 95°F or higher in the mid and upper Valley. Once again, should rainfall be scarce and periodic dry "heat spikes" develop, the number of 100°F or higher days along and west of US 281/IH 69C could approach 10 or more, favoring locations along the Rio Grande from McAllen to Falcon.

Preparedness, Awareness

The forecast is high confidence for a generally warm and dry period, and despite some uncertainty on bi-weekly teleconnections that are not showing decent trends at the start of November, we think November 2017-January 2018 will end up similar on the whole to November 2016-January 2017. Hazards/potential impacts are identical.

- **Drought Severity.** Falcon Reservoir got the water they needed to assist with any spring irrigation that may be required should the fall, winter, and early spring warm and dry overall trends bear out. That said, smart **conservation** should always be part of everyone's water use plans in our ever-growing Valley. Crop and livestock irrigation remain very likely during the remaining spring 2018 growing season based on the expectation of *widespread severe drought*, with pockets of *extreme drought* likely by late April and May as evaporation rates increase steadily with the higher sun angle. The only saving grace would be a continuation of "just in time" moderate to heavy rainfall, which has been the case since 2017. That possibility looks to be declining for the remainder of spring 2018 with "time" running out.

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

- **Wildfire Danger.** High values of the [Keetch-Byram Drought Index](#) (above 500) were seen across all of Deep South Texas by mid March, with increasing pockets of 600+ values in the agriculturally rich Lower Valley region. A spring with expected below average rainfall (a season with low rainfall to begin with) would accelerate these values into the danger zone (600 to 800) which, combined with low recovery of rangeland following the winter curing in locations such as northern Hidalgo, southern Brooks, central Jim Hogg, and central/northern Zapata County, the threat for rapid to explosive growth wildfire becomes very real during cases of dry, hot "fronts" similar to those which occurred in [April 2011](#). Already in March, sugar cane burns from Mexico spread embers to the Santa Ana National Wildlife Refuge just south of Pharr, charring 300 acres on March 7th and beyond; other large fires burned in Kenedy County that day. The combination of moderate cured fuel loading (grasses, small brush, and assorted "duff") and sufficiently strong winds and

very low humidity could exist in a number of locations for the rest of spring. It is **vitaly critical** be [Firewise](#), anytime! Follow Smokey Bear's advice: [Only you can prevent wildfires](#).

- **Heat.** While there's a slight "lean" for lower vs. higher humidity days this spring, the potential is high for a number of days, particularly in May, for the combination of temperature and humidity to produce apparent temperatures – a heat index – at or above 108 degrees. Favored locations would be along the Rio Grande west of US 77/IH 69C including McAllen to Falcon Dam. Should these conditions develop well before the typical start of the summer swelter (i.e. early to mid June), residents and visitors may not be fully acclimated to the conditions. Learn all you need to know about heat safety [here](#).
- **Poor Air Quality.** April and May bring the peak of the eastern and Yucatan Peninsula of Mexico agricultural burning season, and should persistent southerly flow in the atmosphere below 5000 feet prevail for any length of time, residual fine particulates (known as PM 2.5) or better known as soot components will drift across the Rio Grande Valley. Conditions are worsened when morning inversions trap pollutants; on several occasions in the past, this combination has led to AQI listed as "unhealthy for sensitive groups" which includes persons with asthma, emphysema, and other respiratory ailments. Drying fronts with northwest or north winds would help to tamp down the impact from these particulates. Track the latest south Texas AQI [here](#).
- **Wind, Hail, and Lightning Storms.** Late March through Memorial Day is "prime time" for damaging straight-line winds, large hail, and impressive but sometimes damaging (through fire starts) lightning storms. Even a non-tropical tornado or two is favored during this period, though it's been since May 2012 that an observed spring twister touched down in the Valley. That said, it was just two years ago on May 31, 2016, that estimated 85 to 95 mph winds tore up buildings and trees in a swatch of southern Hidalgo County, with well over \$5 million in damage. In spring 2013, one with relative dryness (though nowhere near as hot as 2018 is expected to be), severe weather struck the lower Valley on [April 28th](#). Be sure to check out our [Hazardous Weather Preparedness Guide](#) for details.