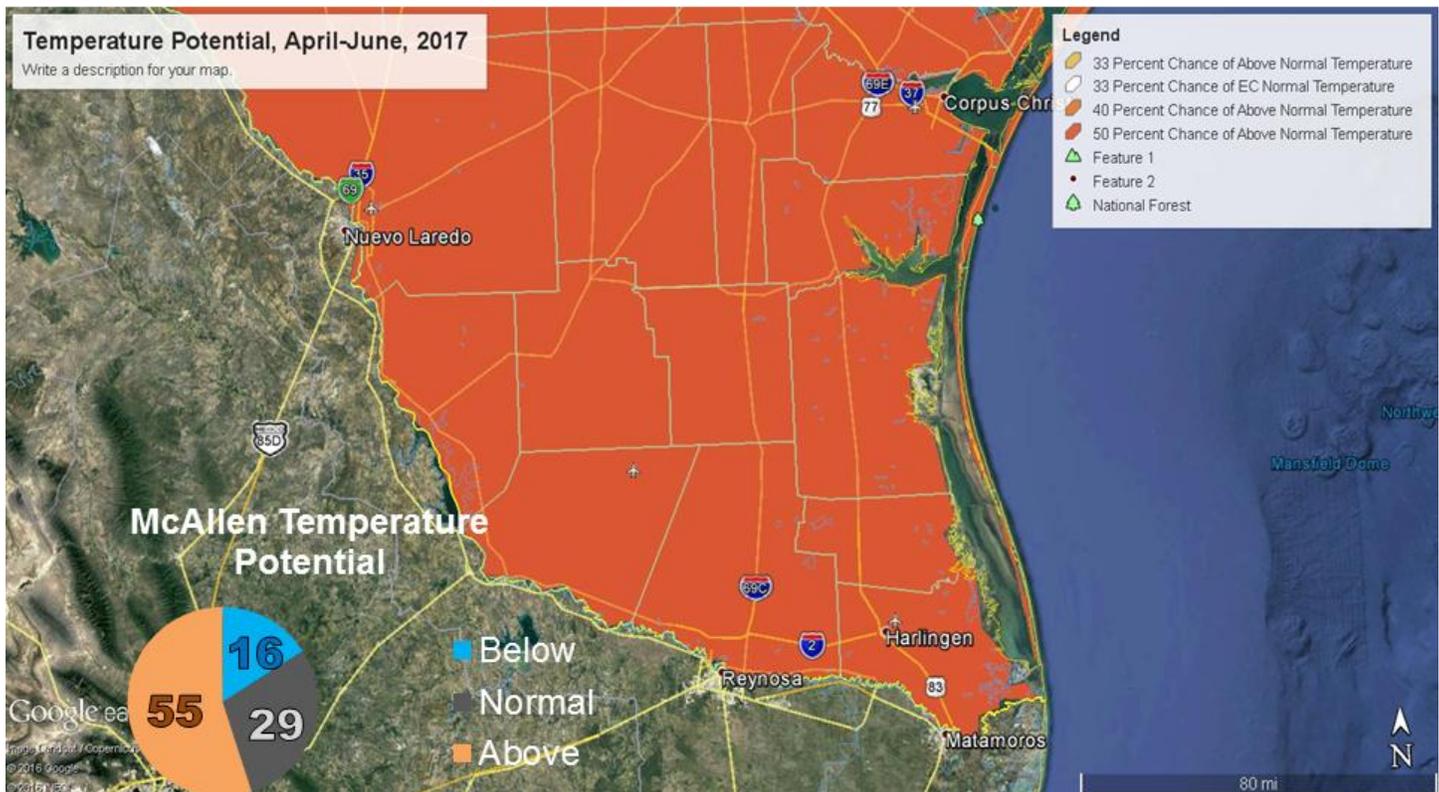


The B(H)eat Goes On and On through June 2017



Rio Grande Valley Average Temperature for April - June (based on 1981-2010)

Wake-Up: Upper 60s Ranchlands, Around 70° Elsewhere

Afternoon: Lower 90s Ranchlands, Around 90° Elsewhere except Mid 80s Beaches

Early Summer Temperatures Arrived in March. How Much Hotter Will Late Spring Get?

Drought Forecast Tricky as “One-Off” Rain Events May Curb Impact

Overview

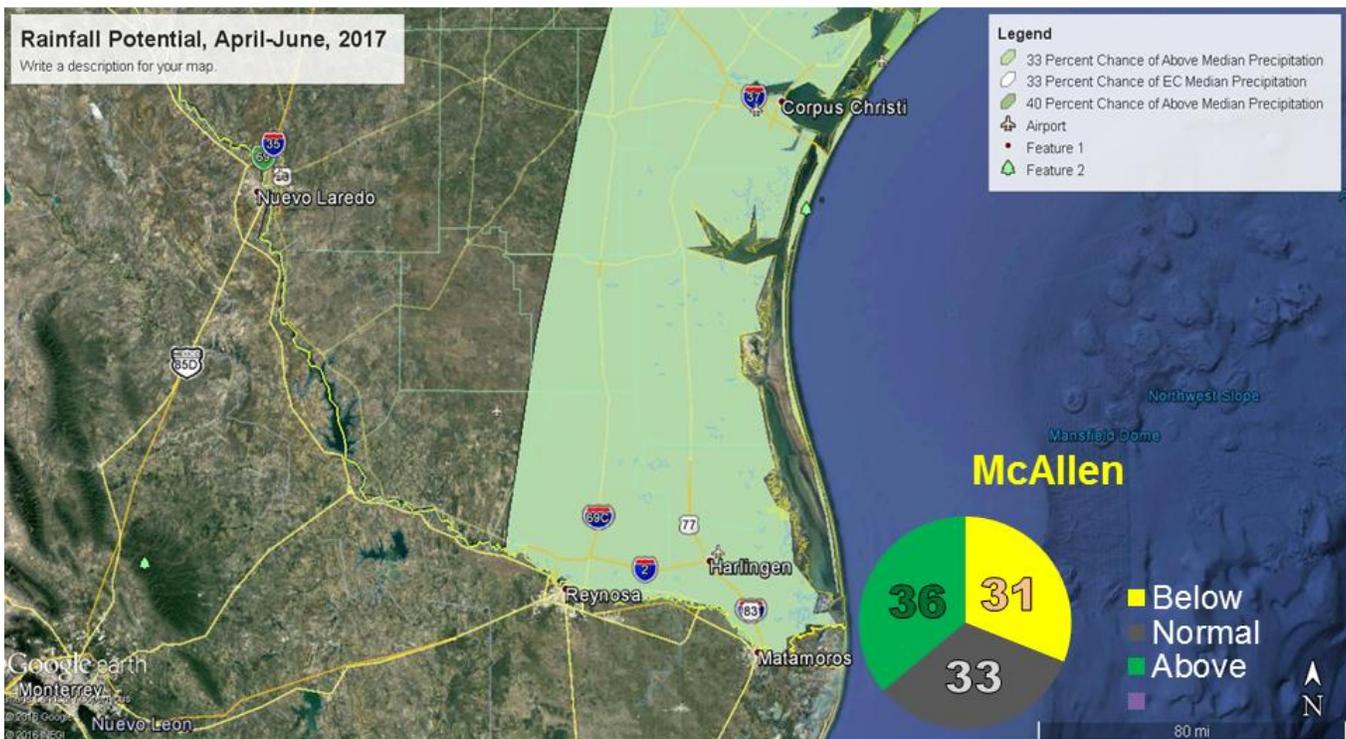
The conclusion of March 2017 brought the **third consecutive month** of all-time heat records to McAllen/Miller Airport, with other Valley locations settling among the top five warmest March after February, and boreal (December-February) winter, shattered prior heat records. By the last week of March, average afternoon temperatures for the Valley were near or just above 90°F, and morning lows were near 70°F – more typical of the end of May than the end of March. A one week period of unsettled weather between March 4th and 10th dumped several inches of rain on the Valley, ensuring the month and for some, the spring season, would end up above average for precipitation as well. But one week was mainly a “one-off” – as the second half of the month was rain-free, with pleasant spring days evolving toward early summer sweat toward month’s end. Will April-June follow suit?

What to Watch For: Big Picture

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

- Hot weather is virtually ensured. A pattern featuring a series of upper level disturbances spinning off a persistent upper level low pressure area south of Alaska, into the Pacific Northwest then diving through the Great Basin before exiting/weakening into the southern and central Plains, will keep the “Valley Wind Machine” in high gear, broken by an occasional wind shift but with little precipitation and minimal temperature change, especially by day. The pattern will lift northward into May, keeping the heat going – but departure from average is expected to shrink as “average” itself heats up (into the low to mid 90s by early June by afternoon).
- Rainfall is a difficult forecast as spring shifts into summer in May and June. April is looking dry and hot overall, though a “one-off” stormy period can’t be ruled out, especially toward month’s end. May is truly a wild card and dependent on whether a diving western U.S. trough can get far enough south to pick up increasingly efficient moisture from the tropics. Flooding rain or severe thunderstorms (wind and/or hail) have affected the Valley and ranchlands in May 2015 and 2016; a “one-off” period or two could do the same from mid-May through mid-June in 2017.
- Wildfire weather was eliminated by late February green-up followed by the early March soaking, but Deep South Texas’ fuels can rapidly dry out in late spring, especially one that ends up hot with occasional dry “spikes” where temperatures surge to 100°F and humidity falls below 20 percent. A prolonged period of dryness that continues from late March into early May could increase the threat for rapid wildfire spread on available – and dry – fuels. Week-long unsettled patterns would help keep things in check, and this is possible between late April and June.
- Similar to wildfire, drought was eviscerated across the Valley by mid-March, with only a pocket of abnormally dry conditions in the Lower Valley at month’s end. Also similar to the wildfire concern is the potential for drought to resurrect itself, especially if little to no rain falls and several days of “dry” heat (humidity below 25 percent) occur, particularly in April and May. Should rains arrive in time, the alternating wet/dry condition would be favorable to spring and early summer crop growth. If not, March and early April growth could be stunted without irrigation.

The Rains (May...and June) Cometh?

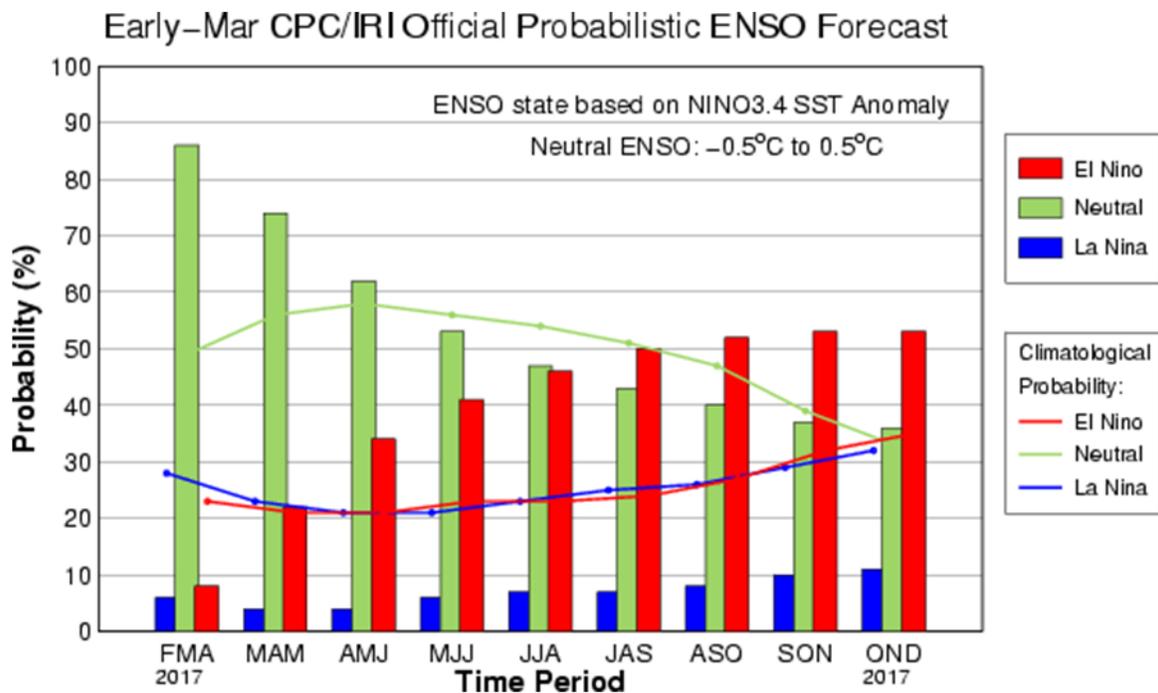


Rio Grande Valley **Average Rainfall** for April-June (based on 1981-2010)
Ranges from 2 to 2 ½ inches

Teleconnections: El Niño Rearing Head?

El Niño/Southern Oscillation (ENSO), met the required five month La Niña (Oceanic Niño Index, ONI, below -0.5) requirement when the November-January three-month was computed, but since the start of 2017 began a quick retreat toward neutral and even weakly *positive* by the end of February. By February, the ONI had risen above -0.5 and ended the very brief cup of coffee with La Niña. Neutral leaning positive conditions were expected to continue through spring, and confidence increased further for at least a weak El Niño episode to resume sometime in summer 2017, as early as July. The combination of the neutral, a continued positive phase of the [Pacific Decadal Oscillation](#) (PDO), and a solid lean toward a positive [North Atlantic](#) and [Arctic Oscillation](#) all favor the continuation of the warm to hot conditions overall through the period. Mid to late winter California storms cooled the nearshore subtropical and mid latitude Pacific waters, but these are likely to return to or even slightly above normal with drier and warmer conditions returning for March and April.

As mentioned above, the rainfall forecast remains difficult. The current “lean” for above average April-June rainfall is likely biased by the potential for one or two singular events – weekly or shorter – between late April and mid-June. With period rainfall averages less than 3 inches, one unsettled week would do the trick, similar to what happened in [April 2010](#), [May 2012](#), and [May 2015](#). The persistently positive phase PDO/NAO/AO could support additional influence of deeper atmospheric moisture, if an upper level disturbance can develop in northern Mexico or dive far enough southward (i.e., Baja California before moving eastward) to activate such deep moisture. This is just another reason why confidence remains a bit lower on just how the late April through June rainfall forecast ultimately turns out.



Above: Probabilistic ENSO forecast through late autumn 2017, showing neutral conditions dominating through spring 2017 before El Niño likely returns by early summer 2017.

Pattern Matters

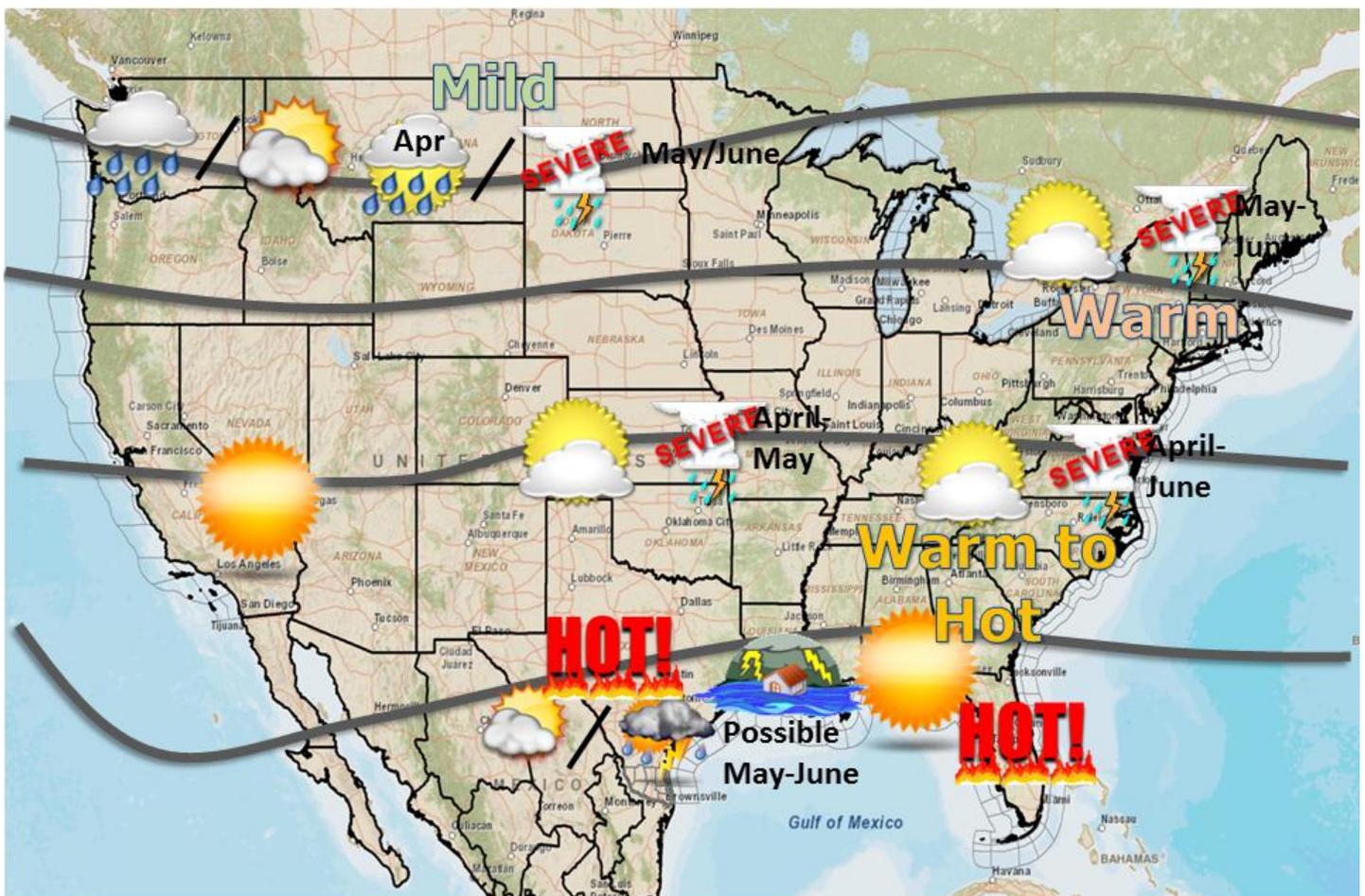
Given all these factors, we expect the U.S. weather steering pattern from April to June 2017 to look as shown below. There are only subtle differences from the [Spring Outlook](#); mainly a general northward building of the southeast U.S. high pressure ridge, and a possible lessening of the “dip” across the southwest U.S. into northwest Mexico and the eastern subtropical Pacific Ocean. The continued expectation of a slight “dip” *might* assist the return of tropical moisture and ultimately rain, some heavy, along with a delayed and shortened severe thunderstorm season with a few events mainly from the late April through mid-May. Such “dips” would be brief, however, and flat west to east flow (similar to what has dominated through the first three months of 2017) could prevail. This “flat” flow, even with embedded ‘dips’, can show very subtle differences that produce

dramatically different results. For example, if the 'dip' is able to tap into deeper tropical moisture up to at least 15,000 feet above the surface on **southerly wind**, the potential for both rain and severe storms increases sharply. If the 'dip' is weaker, and the mean flow through 15,000 feet is a **southwest or west wind**, the downslope (drying and heating) component will continue to choke off the necessary moisture – and instability (ability of air to rise unencumbered through the atmosphere) – for significant rain and severe weather. Uncertainty reigns (rains?) on if, and when, the sharper 'dips' might occur, explaining why confidence in the precipitation forecast shown above is **low**. Temperatures are a different story, as confidence remains **high** for all parameters dictating temperature trends to remain on the above average side.

In terms of sensible weather, the Valley can expect more sunshine than clouds, but also plenty of the “Valley Wind Machine” (through at least mid-April). The “machine’s” return is based on a continued parade of surface low pressure systems re-forming east of the Front Range of the Rockies and moving out into the southern and central Great Plains, which has been the case for the second half of March 2017. Some of these cyclones will be potent enough to produce severe thunderstorm and tornado outbreaks, which could include north Texas, Oklahoma, Kansas, Missouri, and Arkansas (at a minimum) on into the Mid-South (Tennessee, northern Alabama, Mississippi, etc.) and favor April, and lifting northward into the central and even northern Plains spreading toward the Upper Midwest/Ohio Valley/Mid-Atlantic states by May into early June.

Elsewhere in the United States, warmer to hotter than average weather is expected across all but the Big Sky and Pacific Northwest, with typically dry weather for the Great Basin and Desert Southwest. Equal Chances (33.3 percent) for above, average, or below average rainfall is expected for the remainder of the contiguous U.S. except for the Big Sky and northern Plains (above average), with a more uncertain potential for above average rainfall centered on Louisiana and southeast Texas.

Expected Steering Pattern April-June 2017



Outlook: Late Spring and Early Summer 2017

April should continue with the hot trend, with 85 to 95°F+ afternoon temperatures dominant and perhaps 80 to 90 percent of days reaching 90° or higher along and west of US 281/IH 69C. In fact, the potential for one to three more dry fronts with wind from the southwest, west or northwest, or a plainly hot atmosphere preceding them could bring two to five century mark (100° or higher) in April as the winds downslope the Sierra Madre. Short of a “one-off” period (few days to a week) of unsettled patterns similar to what occurred between March 4 and 10, rainfall will likely end up below the already low monthly average (April average range from 1 to 1.5 inches). The potential rainfall deficit combined with the hot weather (temperatures 3 to 4°F above the average of upper 80s by afternoon and low to mid 60s each morning) will likely worsen dry/drought conditions and potentially increase the threat for rapid spread of wildfires on untended brush and grasslands.

May should continue to see the heat build, with 90°+ afternoons likely to be include nearly all days along and west of US 77/IH 69E. 100°F afternoons will become more common across the Upper Valley and Rio Grande Plains as the month wears on, with the number of 100°F afternoons across the more populated Valley dependent on just how hot and dry the atmosphere remains. The potential for severe storms (mainly damaging wind and hail) and flash flooding will peak in May, but only during unsettled periods as was the case in 2015 and 2016. Should the rains not arrive, any drought conditions and wildfire spread danger will worsen further. May is also traditionally a month where heat index – how it feels when temperature and humidity are combined – peaks. This occurs when the atmospheric pattern pumps unusually high surface humidity while the pattern aloft favors dry and hot/very hot weather. The combination can become potentially deadly, even in one of the hottest locations in the U.S., when the “feels like” temperatures reaches or exceeds 111°F for several hours.

June is typically the most uncertain month for the April-June window in any seasonal outlook. How will the pattern transition into summer? One of four things could happen: 1) The expected April-May pattern continues into June, but lifts farther north, leaving the Rio Grande Valley even hotter and drier than in May. 2) The pattern lifts, but upper level disturbances get “left behind” in northern Mexico and become potential prodigious rain producers, even if for a week or less. 3) La Cañicula (the oppressive high pressure ridge that parks in northern Mexico through southwest/west Texas between early July and mid-August) gets a head start. 4) Tropical waves develop in the western Caribbean and/or Bay of Campeche, and slide northwest toward Texas and Louisiana underneath a ridge that parks from the southeast U.S. through Bermuda. All of these patterns have some merit, but the favored is #2 based on recent trends and analogue cases. Outcomes from #1 and #3 would favor a continuation of more slowly worsening drought and continued wildfire spread potential (though lessening due to lower wind speeds overall), as well as potentially dangerous heat.

Preparedness, Awareness

We've moved heat safety into the top spot for preparedness, based on the high confidence of continued increasing temperatures as well as an upper level pattern that favors frequent occurrences of the “Valley Wind Machine” which could draw sufficient surface humidity to create potentially dangerous heat levels relatively early in the ‘warm’ season, impacting the normally steady acclimation process as spring turns to summer. The recent springs of 2015 and 2016 which By late March and April and continuing through May, despite a lean toward drier than average conditions, we bring back the threat for severe weather (wind damage and large hail), as well as an increasing potential for one or two thunderstorm “cluster” events that result in flooding with perhaps several feet of water in poor drainage locations – but for now, flooding is lowest on the priority list through spring.

- **Heat and Hydration.** March's plethora of 90°F+ days, including a few with higher dew points that nudged the heat index toward 100, are likely to be a harbinger of conditions to come through April and May. Dry heat, however, 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 an early summer-like season beginning in April. For heat safety tips, check our local [heat awareness page](#) and the NWS [national page](#).
- **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

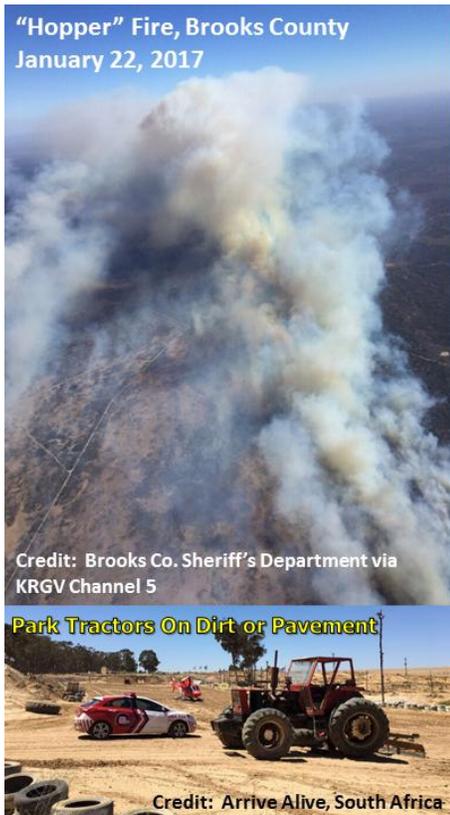
level flow underneath subsidence inversions set up often by warm/dry air above the surface flowing from the Sierra Madre Oriental often trapped fine particulates of soot near the ground, causing frequent periods of deteriorated air quality. Persistent periods when agricultural burning is maximized and 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).

- **Thunderstorms and Tornadoes.** Though down the list for spring 2017 potential impacts, those impacts could be memorable for communities struck by dangerous wind or hailstorms. Spring 2012, also a solidly above average season, featured periods of hail, damaging winds, and tornadoes between the end of March and middle of May. These included the infamous \$600+ million dollar [McAllen hail and wind event on March 29](#), and a week of severe weather between May 8 and 15, including a close shave with 100+ mph wind gusts that raked portions of the ranchlands. Any series of “Baja upper lows” remaining intact while moving through northern Mexico and Texas in April and May could deal a similar blow. We only need to step back to [May 31, 2016](#), and [April 24, 2015](#), as well as April 20, 2012, to remember the impacts of wind and very large hail on the Rio Grande Valley.

Residents should take some time in March 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, and review the [2017 Hazardous Weather Guide](#), pages 4 through 12.

- **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.
- **Wildfire Behavior.** Early greenup (mid February) and the week of locally heavy rainfall between March 4 and 12 eliminated the threat for rapid wildfire spread potential for much of March. That said, a period of dry fronts toward month’s end combined with temperatures in the 90s, particularly along and west of U.S. 281/IH 69C began a steady to locally rapid drying out of the additional fuel growth (grasses, brush) as March turned to April. With a generally dry first three weeks of April expected, as well as additional heat and a few more dry fronts, erratic wildfire behavior could become a notable issue. Lack of rainfall from late April into May would worsen the situation – and as has been mentioned often in this article, the confidence is low. How fire season evolves later in May and June is completely dependent on widespread rain events.

Farmers, ranchers, and hunters should continue to follow safety precautions on dry days, including parking vehicles on dirt or pavement, avoiding driving in high grasses, refraining from using welding/grinding equipment in or near high grass/brush, and postponing target practice. [Be Firewise!](#) Remember, [only you can prevent wildfires](#).







Only YOU Can Prevent Wildfires – Smokey Bear. Here’s How

It Only Takes One Spark to Cause a Conflagration When Humidity Is Low, Winds Are High, and Temperatures are Warm. Follows These Tips When These Conditions Exist:

- Use Welding and Grinding Equipment on Paved or Dirt Surfaces Only
- Avoid Driving Vehicles Over High Grass
- Dispose of Cigarettes in Vehicle Ashtrays or Metal Receptacles
- Postpone Target Practice for a Better Day
- If Possible, Have Power Lines Tightened to Withstand Winds Above 40 mph.

- Drought Severity.** Despite the welcome rains from March 4 through 10, drought is never too far from the minds of residents of the Rio Grande Valley. Two important “-ations” of the Valley’s complicated water use system may still become a need by mid to late April and beyond, should the heat continue with little or no rainfall: 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 late April through June rainfall fails to materialize and the return of El Niño in summer potentially puts the damper on deep tropical moisture and cyclones.

Drought Severity Classification			Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
Category	Description	Possible Impacts					
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