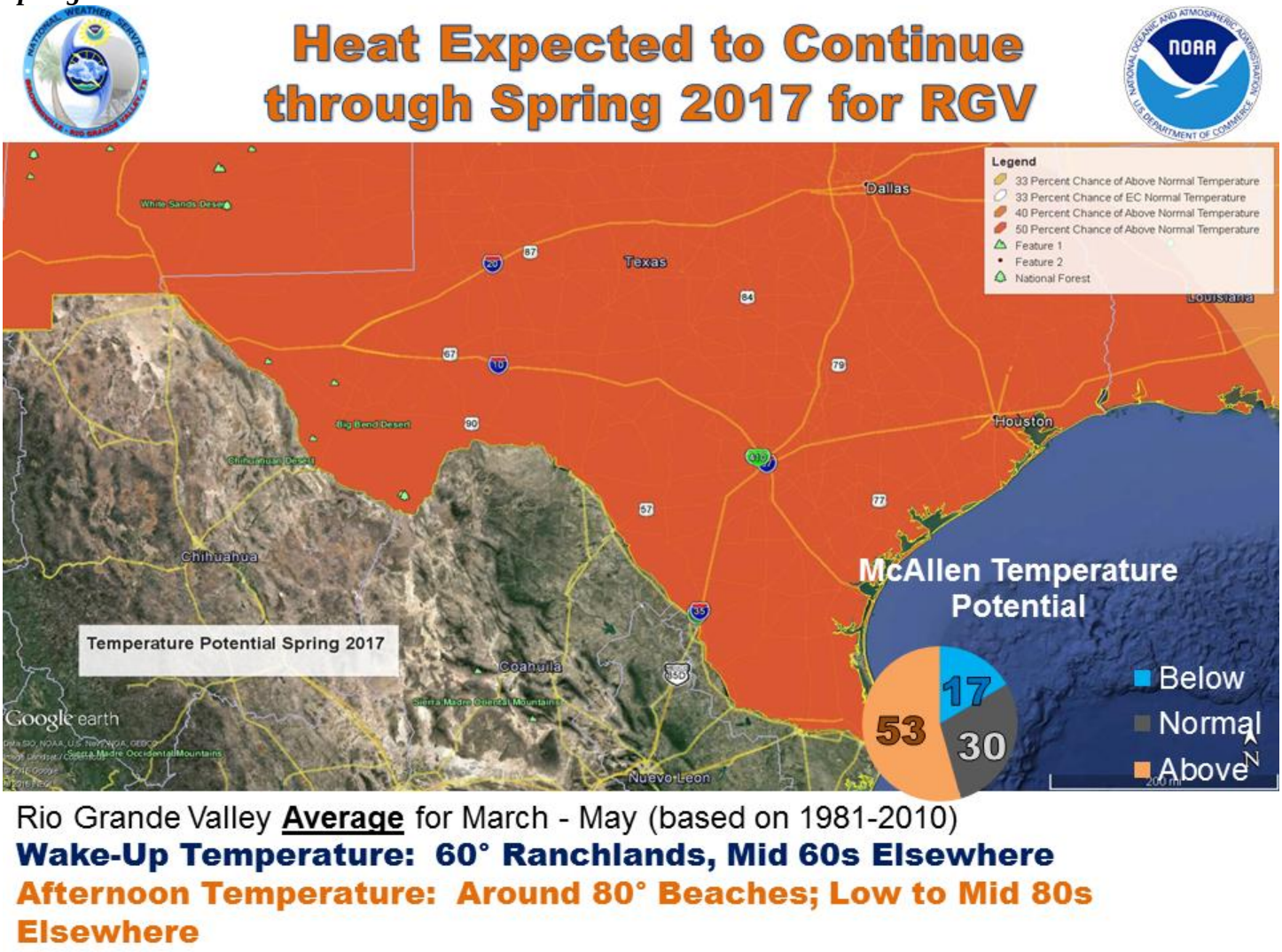
Spring 2017 Outlook



April Weather Arrived in February. Is Summer Far Behind?

Drought to Worsen as Spring Goes from Warm to Hot

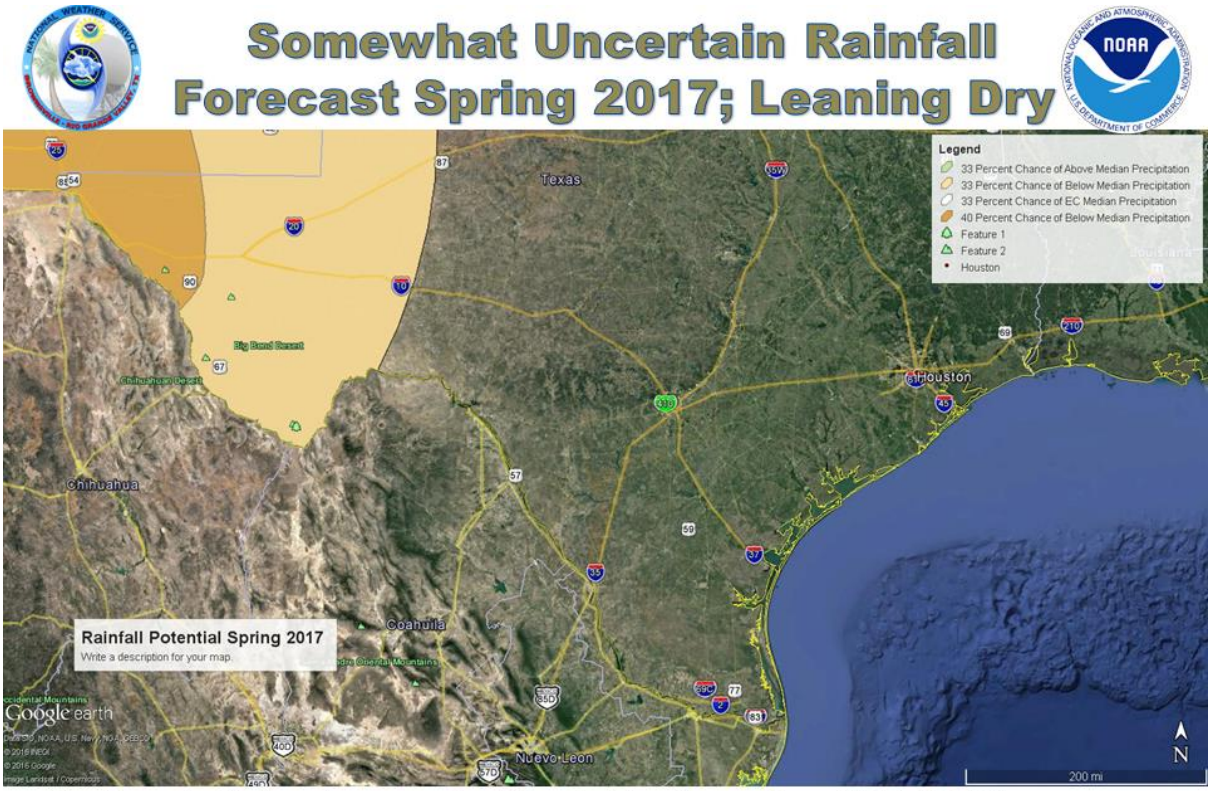
Overview

By the end of February 2017, the Rio Grande Valley was ready to remove the famous Groundhog from forecasting "six weeks of winter" ever again. In a month that would shatter many prior records, and featured more than one-third of days with 90°F afternoon maximums along the Rio Grande from McAllen west, 5 to 10 such days elsewhere except along the coast, and most interestingly a very early full greening and flowering of all local flora (more typical of April), most folks would ask if winter 2016/17 ever ***was*** at all. Even summer cicadas made an appearance near the coast before winter's end. With the exception of four notable chilling front, two in December and two in January, including a two-night weekend freeze on January 7-8 (the first in nearly six years), warm to hot and mainly dry weather was the story between December and February, with near or new record average temperatures for the season. As February turned to March, all indications strongly suggested the warm to hot weather would dominate meteorological spring (March to May) 2017 – though there was a little more uncertainty on how rainfall would shape up.

What to Watch For: Big Picture

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

- The winter pattern disappeared with the Groundhog in early February, and the first half of March shows not only no signs of any significant "cold" fronts, but frequent periods where 90°F+ afternoon temperatures reoccur. There will be no "sharp" changes from summer to winter "feel" as there was in early March, 2014.
- Wildfire weather remained a story in February, peaking with an impressive four cloudless, "desert" dry and hot days from February 21 through 24 when afternoon humidity fell below 10 percent while temperatures soared into the 90s, and three of the days had wind speeds over 20 mph able to "wick" away any moisture not dried out by the heat and low humidity. Additional drying due to minimal rainfall, warming temperatures, and perhaps one or two more "dry" fronts that bring low humidity and gusty northwest wind will continue the threat for rapid to explosive growth of wildfires on such days through March and perhaps into early April.
- Severe drought remained in northern Hidalgo at the end of January, and moderate drought expanded for much of the remainder of the Valley. Confidence in above-to-much above normal temperatures through spring, combined with a lean toward drier than an already dry season (see below map for the 30 year average rainfall for March-May), portends further expansion of severe drought through March, and even introduce some areas of extreme drought at some point. April may be an inflection point – welcome rains would slow down or reverse drought impacts, but continued low to no rainfall would certainly push more areas into extreme drought and require significant irrigation for the growth period of many Valley crops. May will highly depend on the steering pattern to our west and southwest – from Baja California through northern Mexico. A stream of southwesterly flow pulling in tropical Pacific moisture will reduce both drought and wildfire spread potential, particularly in April and May; a west to northwest flow (which dominated much of February) overtop of a "flat" high pressure ridge would ensure extreme drought and unseasonable heat.



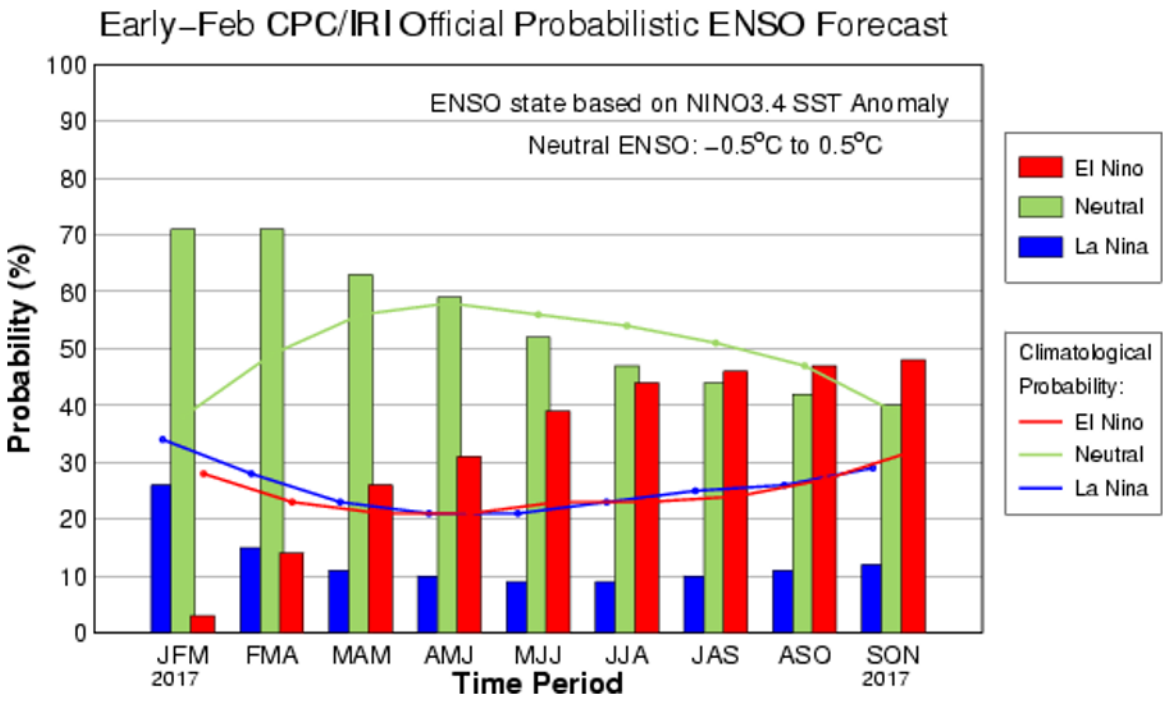
Rio Grande Valley Average for March-May (based on 1981-2010)

Precipitation: Ranges 4 ½ inches Mid/Upper Valley to 5-6 inches Ranchlands and Lower Valley

Teleconnections: La Niña, we Barely Knew Ya

El Niño/Southern Oscillation (ENSO), met the required five month La Niña (Oceanic Niño Index 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. Neutral leaning positive conditions were expected to continue through spring, but confidence was increasing for at least a weak El Niño episode to resume sometime in summer 2017. The combination of the neutral, a continued positive phase of the Pacific Decadal Oscillation (PDO), and a "lean" toward a positive North Atlantic and Arctic Oscillation all favor the continuation of the warm 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 could be a bit more difficult especially by April; 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 April's, and especially May's, precipitation forecast ultimately turns out.



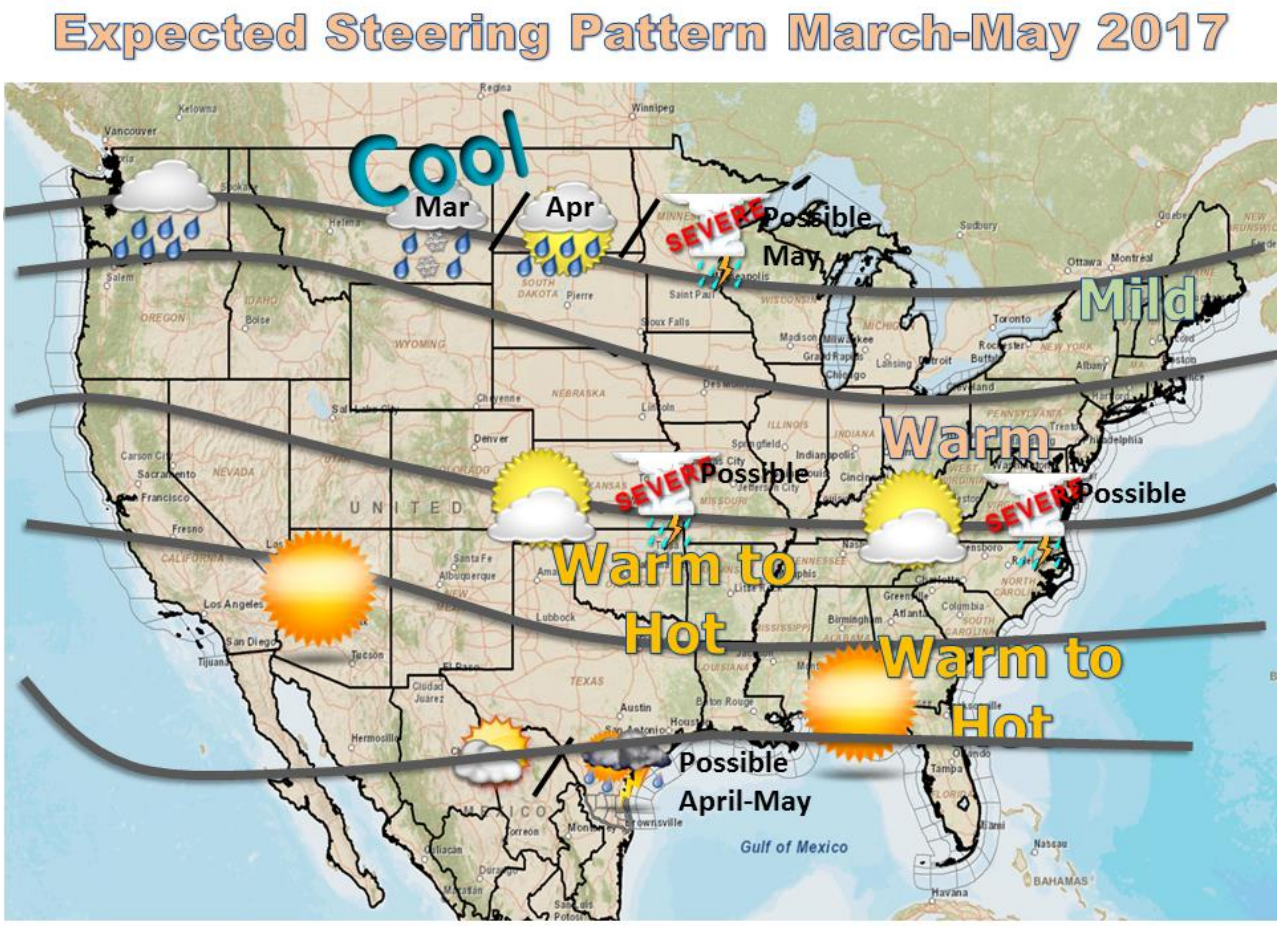
Above: Probabilistic ENSO forecast through autumn 2017, showing neutral conditions dominating through spring 2017 before El Niño likely returns by summer 2017.

Pattern Matters

Given all these factors, we expect the U.S. weather steering pattern from March to May 2017 to look [as shown below]. The main difference from the February to April outlook is a slight "dip" in the steering pattern over the southwest U.S. and Baja California, which ***might*** assist the return of tropical moisture and ultimately rain, some heavy, along with a fairly typical severe thunderstorm season with a few events mainly from the end of March through the middle of May. Such "dips" would be brief, however, and flat ridging (similar to that shown in the February to April Outlook) would dominate, with drier conditions aiding a slow degradation of drought conditions. Unfortunately, for rain-wishers in the Rio Grande Valley, steering flow from the northwest from both typically drier locations of the southwest U.S. and the intermountain western U.S., as well as the relatively cooler eastern non-tropical Pacific Ocean will "shut the door" for any deep tropical moisture from both the western Gulf and the subtropical and tropical Pacific – each which will have abundant but untapped warmth and humidity for the most part.

In terms of sensible weather, the Valley can expect more sunshine than clouds, but also the periodic “Valley Wind Machine” (which does continue through March and sometimes into early April). The “machine’s” return is based on occasional to frequent surface low pressure systems forming east of the Front Range of the Rockies and moving out into the southern and central Great Plains. Some of these cyclones may be potent enough to produce severe thunderstorm and tornado outbreaks, which could include north Texas, Oklahoma, Kansas, Missouri, and Arkansas (at a minimum) and favor March into April, and lifting northward into the central and even northern Plains spreading toward the Upper Midwest/Ohio Valley/Mid Atlantic states by May.

Elsewhere in the United States, dry weather is expected across the Trans Pecos (Texas/New Mexico) Cool to cold and somewhat snowy (March) and rainy (April and May) spots appear to be confined to the northern tier of states, as well as the Pacific Northwest, while southern California and the southwest U.S. return to dry weather with the now-defunct record drought of the past several years (ending this winter) remaining stabilized, for now.



Outlook: Spring 2017

March should continue with the warm trend, with 80°+ afternoon temperatures dominant and perhaps half of all 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 west or southwest preceding them could bring additional century mark readings (100° or higher) in March, April, or even May in an environment of southwest to west winds downsloping the Sierra Madre. Near but leaning below average rainfall (monthly average ranges from just below an inch to just above an inch) is likely, though we’ll be watching for the potential for thunderstorms along and just south of stationary fronts separating warm to hot and soupy air from drier and somewhat cooler air to the north.

April and May should continue to see the heat build, with 90°+ afternoons becoming the majority in April and perhaps complete in May; “cold” fronts in name only may provide the potential for early to mid-April heat “spikes” which would surge single-day temperatures above 100°. Toward late April and especially in May, as we saw in 2015 and 2016, the potential exists for convective (thunderstorm) systems along slow

moving/stationary fronts – though long term pattern signals suggest the chance in April/May 2017 remains a hair lower than in recent years. If the rains don't come, especially in April, drought conditions will continue to deteriorate and likely range from severe to extreme by May. Drought Category descriptions are below.

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: ▪ short-term dryness slowing planting, growth of crops or pastures Coming out of drought: ▪ 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	▪ 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	▪ 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	▪ 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	▪ 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

Preparedness, Awareness

Several warm to hot and very dry days in February, culminated by the consecutive days of less than 10 percent afternoon humidity just before month's end, combined with the continued high confidence of above to much above normal temperatures through May keep the threat for erratic to extreme wildfire behavior to the top of the spring list of preparedness. Second becomes heat safety, as a warmed atmosphere combined with periodic influxes of high humidity could push heat index, or "feels like" temperatures, to or above 105 on several days beginning in April and more frequent in May. 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.

- ***Wildfire Behavior.*** The worsening drought and dried fine fuels (grasses) and "long period" fuels such as brush and trees (mesquite, live oak) remains sufficient to maintain the threat for erratic wildfire behavior and spread, especially on days with gusty winds and humidity below 25 percent. Early greenup (mid February) could become an early brown-out with additional drying breezy to windy fronts with sunshine to follow, and mild to warm air would quickly worsen the situation for rapid to explosive wildfire spread. 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.*** 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.

- ***Heat and Hydration.*** February's plethora of 90°F+ days, including a "spike" of century mark readings on the 23rd, may be a harbinger of conditions to come through spring. Fortunately in February, the heat was a "dry" heat with feels like temperatures at or a degree or two lower than the actual temperature. 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.

- ***Thunderstorms.*** 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.

- ***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.

For all your spring weather safety tips, check out our Hazardous Weather Awareness Guide (last update: 2016) here.