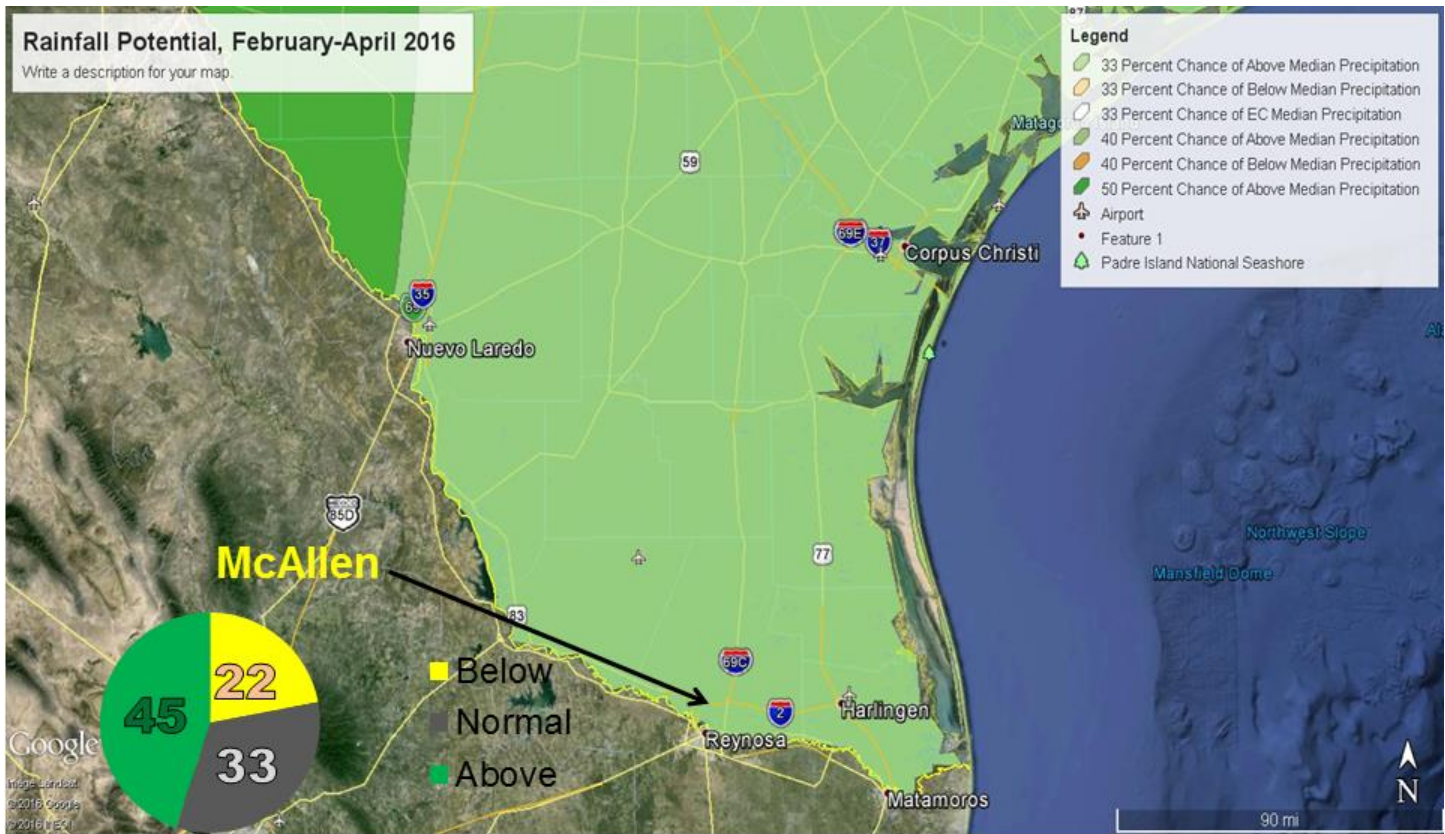


February-April 2016 Outlook



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

Precipitation: Ranges from 3 ½ inches inland to 4 ½ -5 inches near the coast

Fits...and Starts?

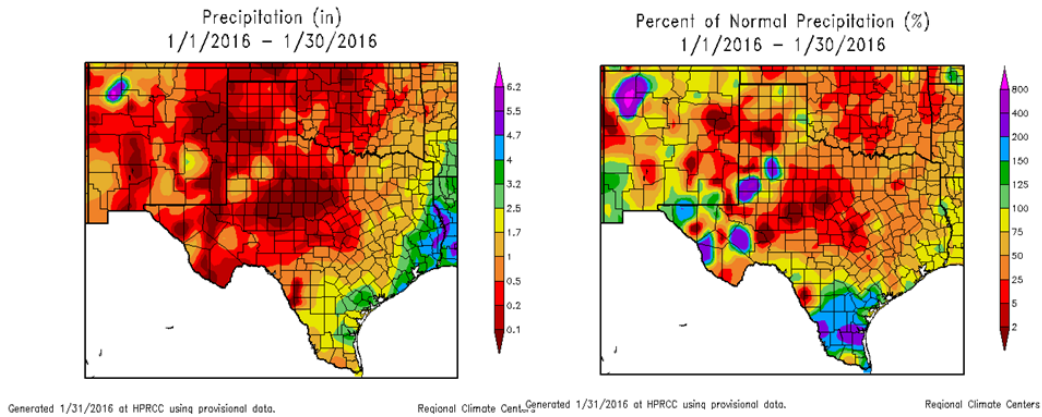
Dry, Cool Weather Dominated January 2016. What Happens Next?

Though El Niño remained among the strongest on record through mid-winter 2016, the difficulty in forecasting exactly where, and how much, precipitation would fall remained an unsolved puzzle. Though the month would end up a little above average for rainfall in the Valley, and much above average across the King Ranch (Brooks/Kenedy), nearly all of that rain fell on the 1st and 2nd (Figure 1, top of next page). After the early month soaking, a series of fast moving systems moved into northern California, lifted over the central Rockies, then cruised through the southern Plains on their way to redevelopment across the southeast U.S. Early month storms left damaging tornadoes in the wake across the central/southern Florida peninsula, and a single, “phased” event set up an historic blizzard across the Mid Atlantic region on the 22nd and 24th (Figure 2). Texas mainly “waved” to the systems which cruised across the southern plains; the Rio Grande Valley saw numerous “dry” fronts, several which produced gusty northwest winds in their wake and “flash” drought conditions which rapidly dried up fine fuels such as grasses and light brush, leading to an enhanced threat of rapidly spreading wildfires. Will that threat continue into late winter and early to mid-spring? Given the difficulty handicapping the exact storm track and connection to the subtropical jet, confidence in any answer is low. There is a lean toward a return of wetter times based on prior history which has shown the subtropical jet to become active in February and early March during past El Niños. However, uncharted territory in 2015/2016 remains still warmer than average water temperatures across the Eastern Pacific, all the way up to the Gulf of Alaska. The persistence of the warm eastern Pacific (Figure 3) may have resulted in the return of the western U.S. high

pressure ridge in January and early February, which kept California rainfall in check. Should the subtropical jet fail to “undercut” the ridge later in February and especially in March, the potential for average to *below average* rainfall will continue across Texas and parts of the southeast U.S. Uncertainty “rains” in the February-April outlook.

The Valley Was “Wet...”

January 1 to 30, 2016



...But Only for Two Days!*

January 1-2 were the wettest of all days

Figure 1. Monthly precipitation (left) and percent of normal precipitation (right), January 2016. For most of Texas, the expectation of a wet mid-winter period was not realized; south Texas/RGV rainfall was “front loaded” on the 1st and 2nd, where more than 3 inches – or double the monthly average – fell.

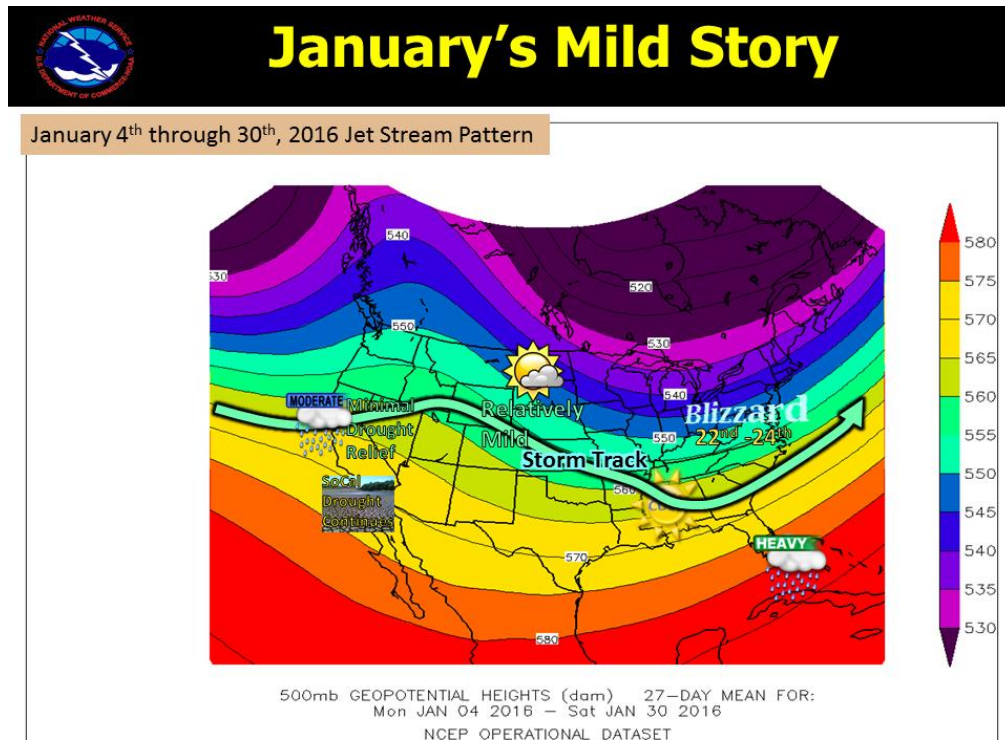


Figure 2. January 2016’s pattern, after the initial rainfall on the 1st and 2nd, was filled with sunshine, frequent cooling fronts, plenty of wind - but little rain for Texas, including the Rio Grande Valley.

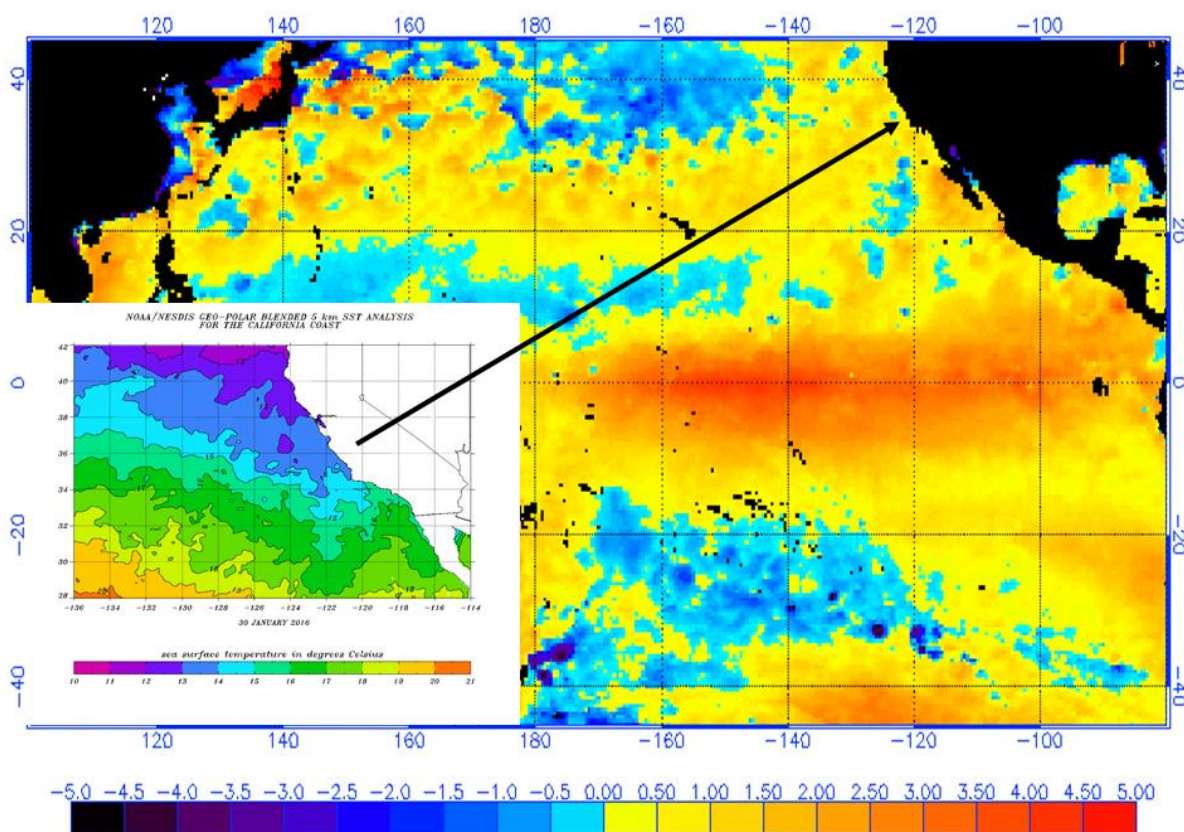


Figure 3. Sea Surface Temperature anomalies for the Pacific Ocean as of January 28, 2016. Note the preponderance of yellow and red on the map. The deep red areas near the equator are El Niño. Above average temperatures, mainly between 55 and 62°F, existed along the California coast (inset, left).

Outlook: Late Winter to Mid Spring 2016

After the humbling temperature forecast (below average) that failed in a big way for October through December, several months advertising below average temperatures finally paid off in January 2016. Frequent fronts kept southerly flow behind departing cool high pressure systems from establishing for more than a few days at a time. The one prolonged cold and wet event (December 31 through January 3) set the month on track – temperatures for the period were more than 10°F below average – to be cool, and dry fronts nudged daytime temperatures back into the 60s and 70s and more importantly, early morning temperatures into the 30s and 40s. Brief warmups weren't enough to counteract the chill, and monthly average temperatures ranged from 1 to 2°F below normal.

The expectation of continued frequent fronts into February maintains confidence for a second below average month in a row. That said, increasing sun angle tends to bring warmer afternoons overall without a blanket of clouds, and it will likely require a prolonged (3 to 7 day) period of low clouds, light precipitation, and northerly flow to ensure February ends up cooler than average. The second half of the month would have to be the difference-maker, as the first half of February (dry and “seasonable” overall) will pick up where January left off.

What might March and April bring? As the atmosphere inevitably warms, whenever more rain than average is forecast, the concern turns to flooding and an increased chance at hail and wind producing thunderstorms. The jury is still out on the severe (hail/wind) threat during an El Niño spring, and both the severe weather and rain potential may depend on the timing of teleconnection puzzle pieces, including the Madden Julian Oscillation and Arctic Oscillation. The Madden-Julian Oscillation can inject sufficient moisture for heavy rain events, while the phase of the Arctic Oscillation may determine if cooler or warmer air masses dominate. March 2010, falling back to weak El Niño (combined with a negative Arctic/North Atlantic Oscillation), was cool to cold – and dry. By April, at the tail end of the 2009/2010 El Niño, a [six day wet period between April 12-18, 2010](#) ensured a minimal fire weather season. See the Preparedness, Awareness section for the details.

For more on the El Niño and Winter relationship for the Rio Grande Valley, check out the [Winter 2016 Outlook](#).

NOAA/NCDC Climate Division Composite Precipitation Anomalies (in)
 Feb to Apr 1958,1964,1966,1973,1983,1992,1998,2003,2010
 Versus 1950–1995 Longterm Average

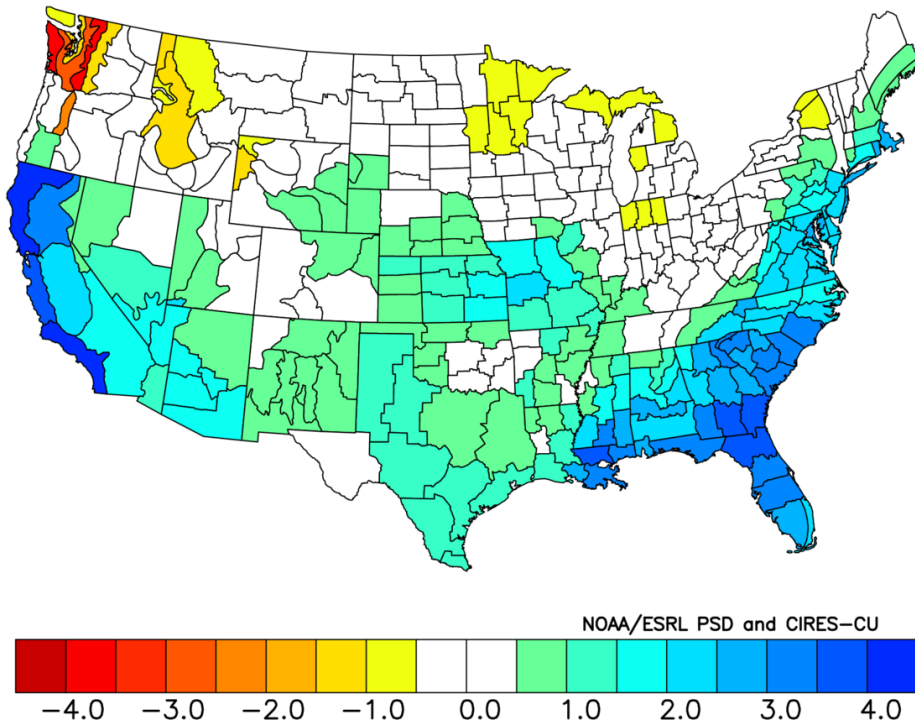
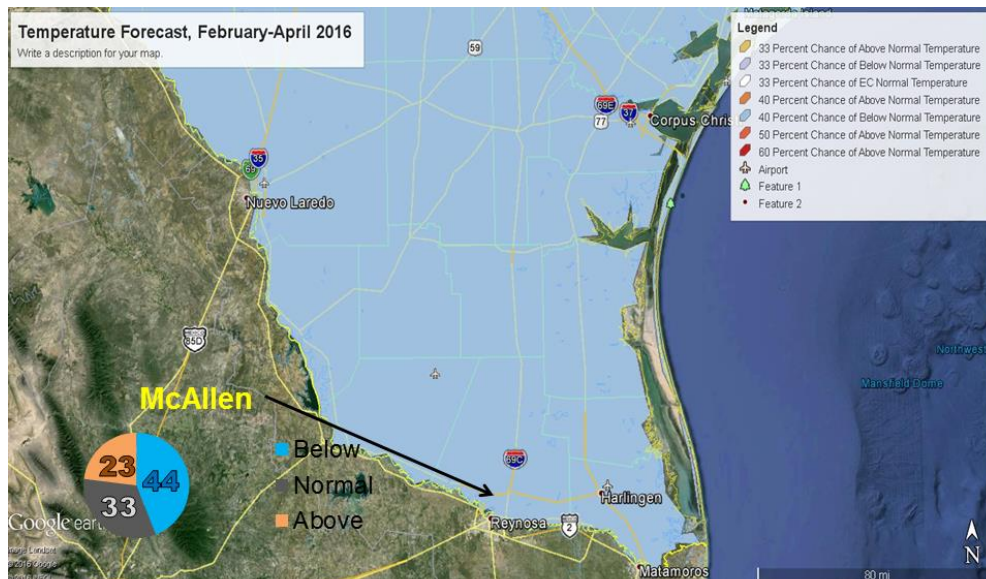


Figure 4: Precipitation departures for analogous El Niño (moderate to strong), February to April, using similar rising/falling Oceanic Niño Index (ONI) trends compared with 2016. For the Rio Grande Valley, one would expect 1 to 2 inches above average for December-February; average is 3.5 to 5 inches, which means another 25 to 50% of rain than what would be expected without El Niño. Note the much stronger signal (3 to 4+ inches above) in Florida than in Texas. This played out in January, 2016 – will it continue through spring? And, will the warmer waters along the California coast (Fig. 3) influence how much more rainfall California receives?



Rio Grande Valley Average for February - April (based on 1981-2010)
Wake-Up Temperature: Around 60°
Afternoon Temperature: Around 80°

NOAA/NCDC Climate Division Composite Temperature Anomalies (F)
 Feb to Apr 1958,1964,1966,1973,1983,1992,1998,2003,2010
 Versus 1950–1995 Longterm Average

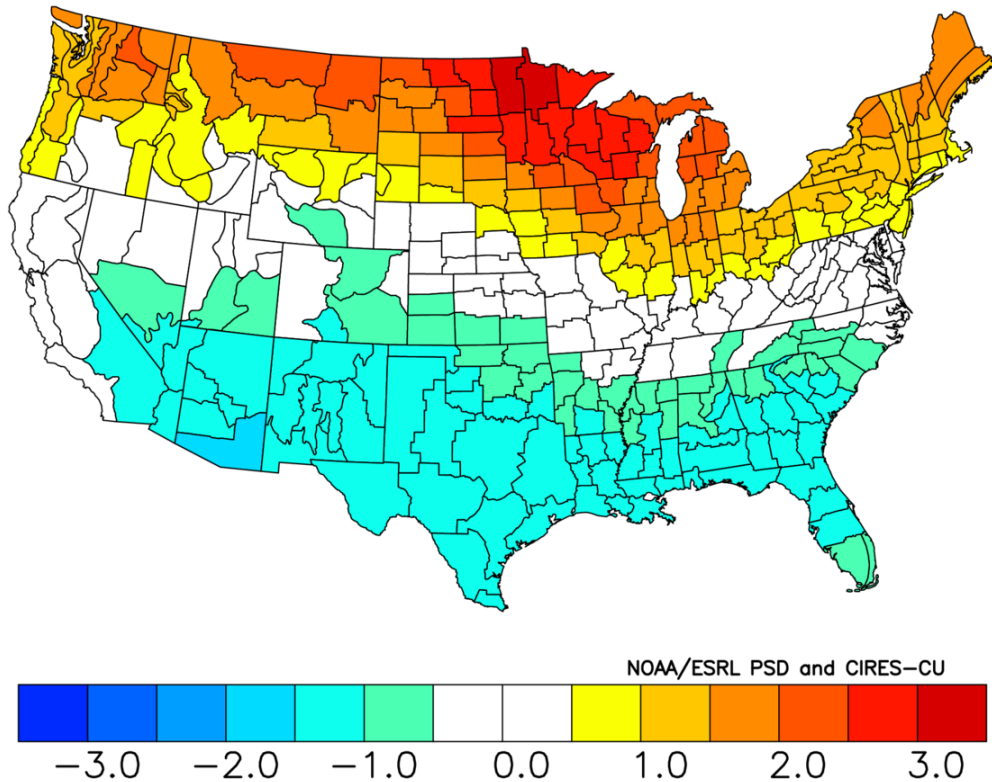


Figure 5 (top): Forecast probabilities for below, “average”, and above average temperature for February–April, 2016. Once again, a healthy chance for temperatures to remain below average and more than double the possibility of them being *above* average, though at 23 percent it can’t be ruled out. **Figure 6 (bottom):** February through April temperature departures from average for similarly developing El Niños to what was occurring in early 2016. Signals are strong for temperatures to be 1 to 2°F below average (80 by afternoon, 60 by daybreak) for the overall period.

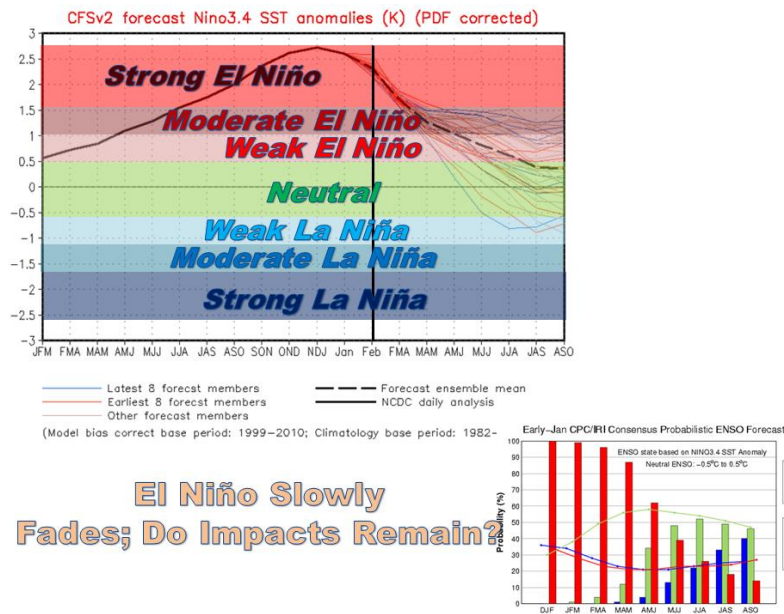
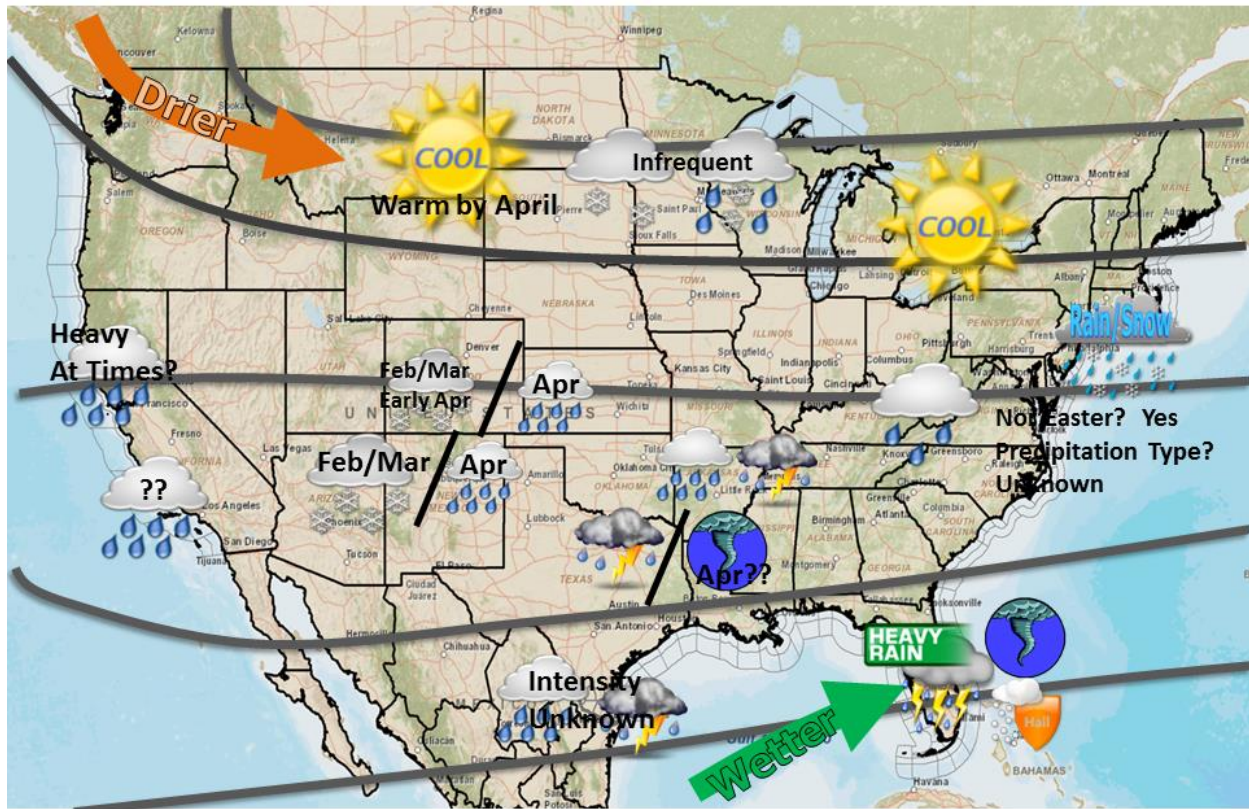


Figure 7. Has the “Super” El Niño of 2015/2016 peaked? Quite possibly. Sea surface temperature anomalies tend to fade as winter turns to spring, especially during a strong El Niño such as those in 1997/98 and 1982/83. Still, it will take a while for the cooler waters to “slosh” toward the eastern Pacific, and the atmospheric pattern of an active subtropical jet stream holding right through spring appears likely.

February-April 2016 Pattern Possibilities



Pattern Matters

There were few changes between the mid-winter/early spring outlook and the late winter-mid spring outlook shown above. If persistence is any guide, as well as some expectation of lag time for the subtropical jet, as well as how the puzzle pieces of the Arctic/North Atlantic Oscillation and even the Madden-Julian Oscillation fit into the mix, there is bound to be some alternation of wetter and drier periods, especially in February and March. As mentioned in the opening discussion, the impact of the warmer eastern Pacific and potential influence of a subsequent blocking ridge along the coast which would deflect systems up and over said ridge and downstream, changing everything for all but Florida. Such is the reason for the number of "??" on the above graphic.

In short, we ask everyone to stay tuned to developments through mid spring. Should February and March follow most of January's lead, the Valley's weather hazards shifts from too much rain and possible hail/wind storms to the spread of wildfires, given the abundant brush and grasses left behind from the heavy rains and/or warm, humid conditions that closed out 2015. Elsewhere, will Southern California still find modest drought relief, which has been the case in Northern California? Will the east coast get a second February blizzard, or will other "Nor'easters" bring a chilly rain? Are April tornadoes in the cards for "Dixie Alley"?

Finally - the cooler than average forecast does not necessarily translate into a better chance for a freeze or any freezing/frozen precipitation. January 2016 was a classic example. Nearly one-third of late nights and early mornings saw temperatures fall to between 35 and 40° across the Rio Grande Valley, and minor freezes were noted across the ranchlands/Upper Valley in late January. These conditions are welcomed by growers, as they keep the insect population down while keeping modest growth rates. Citrus, for one, thrives in chilly and relatively dry winters without a freeze.

While the chance of a hard freeze remains nearly zero, any pattern that can bring some Canadian air to the Valley with clear skies and light winds can bring a light frost or freeze, not only in February but also in [March](#).

The key puzzle piece would be the development of a persistent negative phase North Atlantic or Arctic Oscillation (NAO/AO). The January 23 ranchland minor freeze occurred at the tail end of a short duration negative phase NAO/AO. Any similar pronounced and prolonged shift during February would increase the threat for a freeze, even as time grows short with the coming spring.

Preparedness, Awareness

October 2015 reminded us of the flood producing power of tropical moisture during an El Niño. While the short term intensity of rains will dip through February, it wouldn't take much to regenerate floods in areas like Willacy County and Weslaco who still remain near saturation.

- **Flooding Rain.** February and March could still see one or more widespread moderate to heavy rainfall events, which combined with additional cloud cover and limited evaporation rates, could pile up water across the Rio Grande Valley, more likely toward the coast – but in a gradual fashion rather than rapid runoff which was a big reason for the late October floods in Weslaco and Willacy County. April is different, as the warming low levels of the atmosphere could hook up with deep tropical moisture to increase the threat for more rapid flood development. We only need to look back to [April 2015](#) to remember the several cases of flooding.

It's always a good time to check roofs and walls for leaky areas and repair; dry periods in February and March 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](#)
- **Chill.** Big wind chill days, when it “feels like” 20s and 10s (°F), have not appeared on the scene this winter. The lowest wind chill thus far was in the mid to high 30s on January 2nd; the lack of cloudy, windy, and cold days kept “feels like” temperatures pretty close to the actual temperature through the end of January. But as recent years have shown us, even early March can produce teeth-chattering 20s wind chills. The best chance for a rapid change would favor the last half of February into early to mid-March. Be ready to change from spring/summer clothes into winter jackets, sweaters, and the like in a matter of hours if “gray ‘northers” return. If you have a space heater and plan to use it this winter, the time to service it to ensure sparks don't ignite into a house fire is now.
- **Freezes and Winter Weather (ice/snow)?** We can't discuss winter without the outside chance. That said, past moderate to strong El Niños have tended to keep the coldest of air locked up well north of the Rio Grande Valley, and the influence of tropical moisture on the atmosphere favors chilly, but not frigid, weather into February and perhaps part of March. There are no certainties, however; atmospheric “teleconnections” such as the North Atlantic/Arctic Oscillation could become a player in cold air intrusion through March.
- **Hail and Thunderstorm Winds?** The expected pattern (above) would keep the threat slim to none through mid- February, but the opportunity for each could gradually increase later in February and especially in March. [March 26th, 2015](#) reminded the region of the onset of our true severe weather season and brought memories for some of [March 29th, 2012](#), so one can always be ready. Preparedness Tips can be found on a variety of guides from [this page](#); click on the links under “severe weather”.
- **Wildfire Spread?** The number of “flash drought” events in January has sounded the alarm to be wary of rapid spread of any wildfires that begin on “crispy” fuels such as grasses and brush. Any period of rain in February and March would put fears to rest, but continued breezy, dry fronts with rapid drops in humidity, combined with the inevitable warming as the sun gains elevation and days lengthen, are points of 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](#).