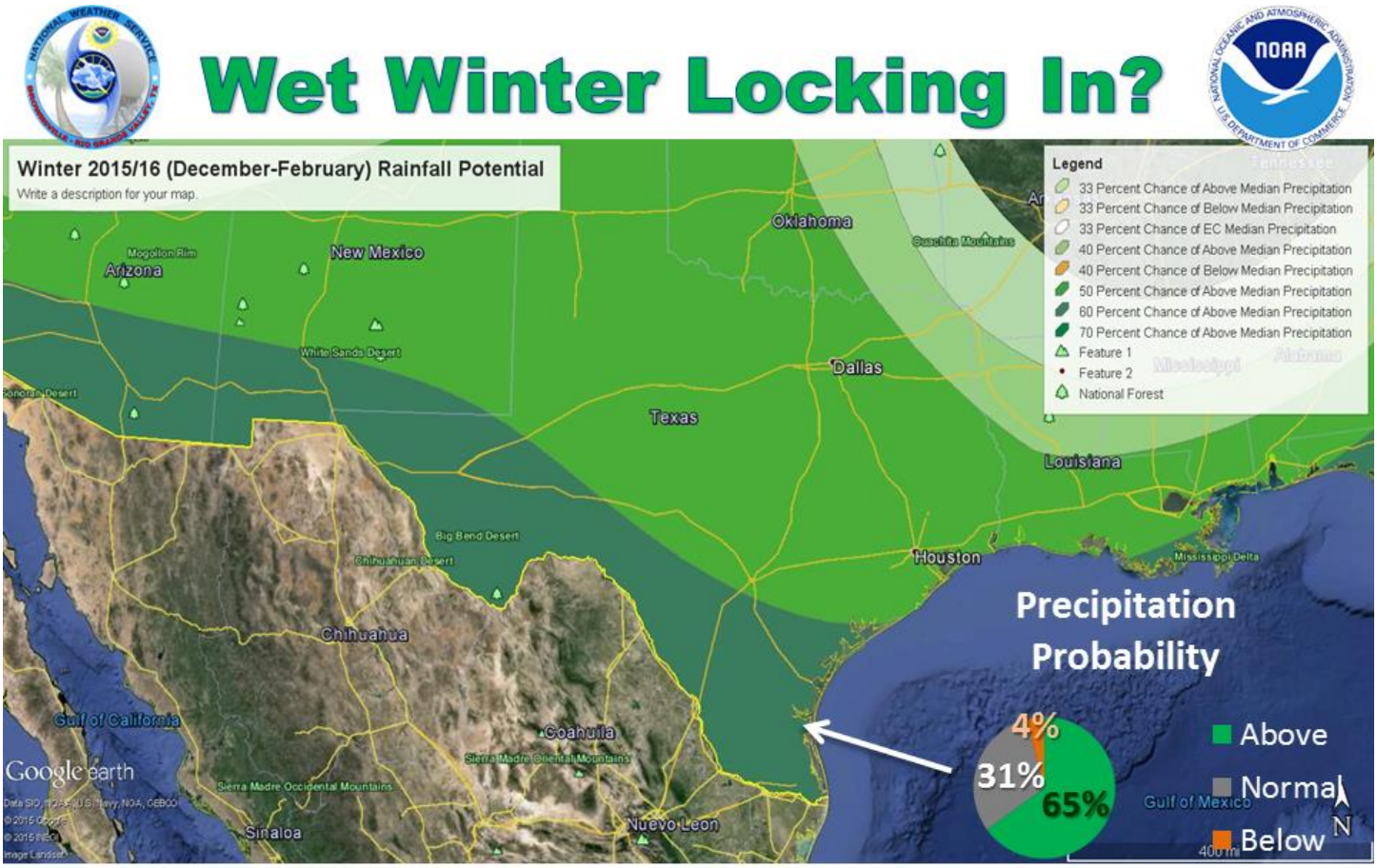
Winter 2016 (December 2015-February 2016) Outlook



Note: Average Precipitation for Period (RGV): 3 inches along the Rio Grande (Starr, SW Hidalgo); 3.5 to 4 inches Elsewhere except 4 to 4.5 inches Along the Coast.

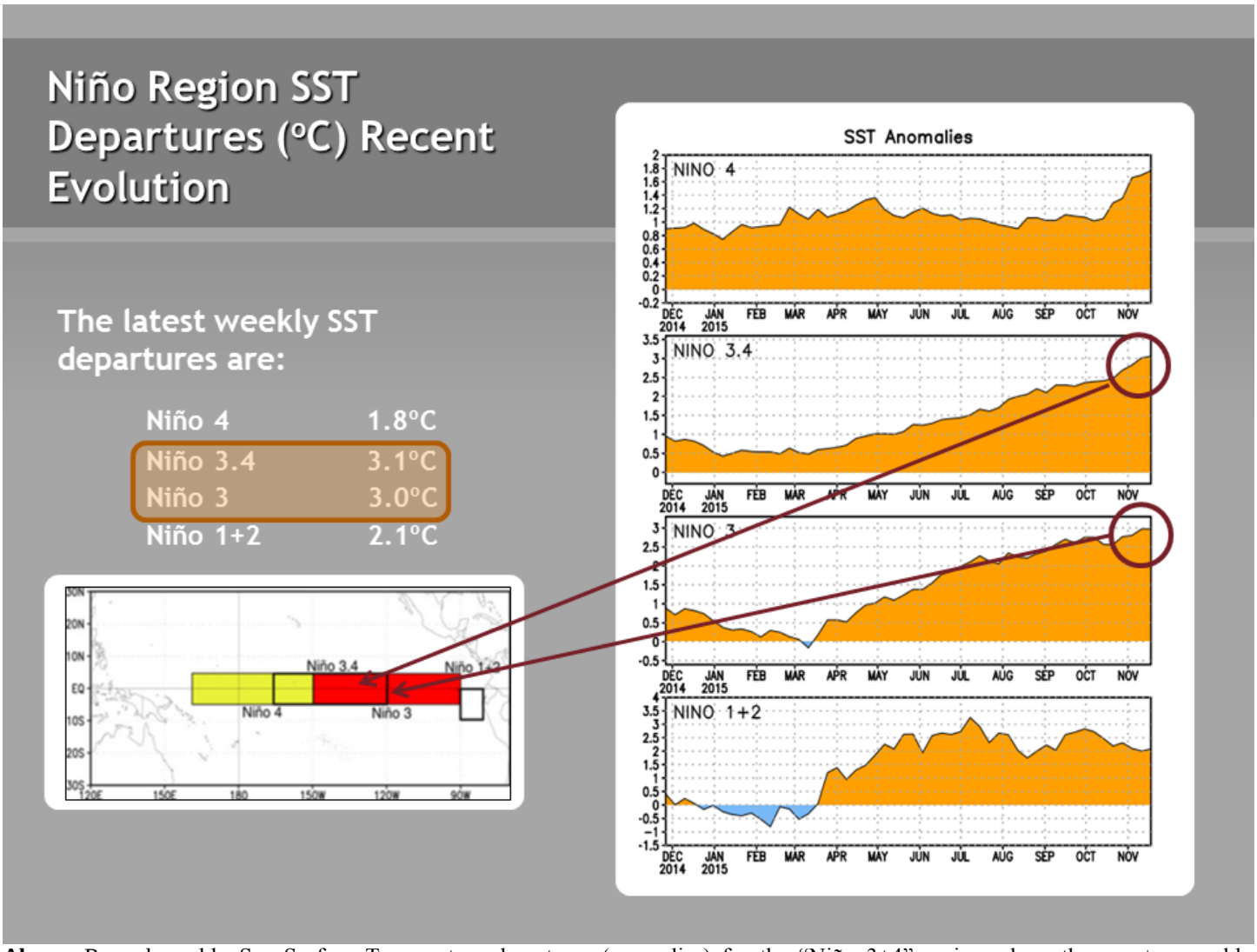
How Green Is My Valley

Rainfall to Keep the Lush Landscape is a Lock, but How Much?

El Niño struck "gold" in late November, reaching a milestone bi-weekly record with the Oceanic Niño Index (ONI) briefly surpassing 3 (below), ensuring at least a multiple period of three month averages will fall into the "strong" category. August-October was the first to do so, at 1.7°C (1.5°C is the breakpoint for "strong") and the recent late November levels will ensure the September-November period is above 2°C for the first time since 1997. El Niño, named for the "Little Boy (Jesus)" due to peak impacts along the northern coasts of South America occurring around Christmas, typically peaks in late autumn and early winter; with only a slow decrease expected to begin 2016, strong values are expected to continue through the November-January period, at least.

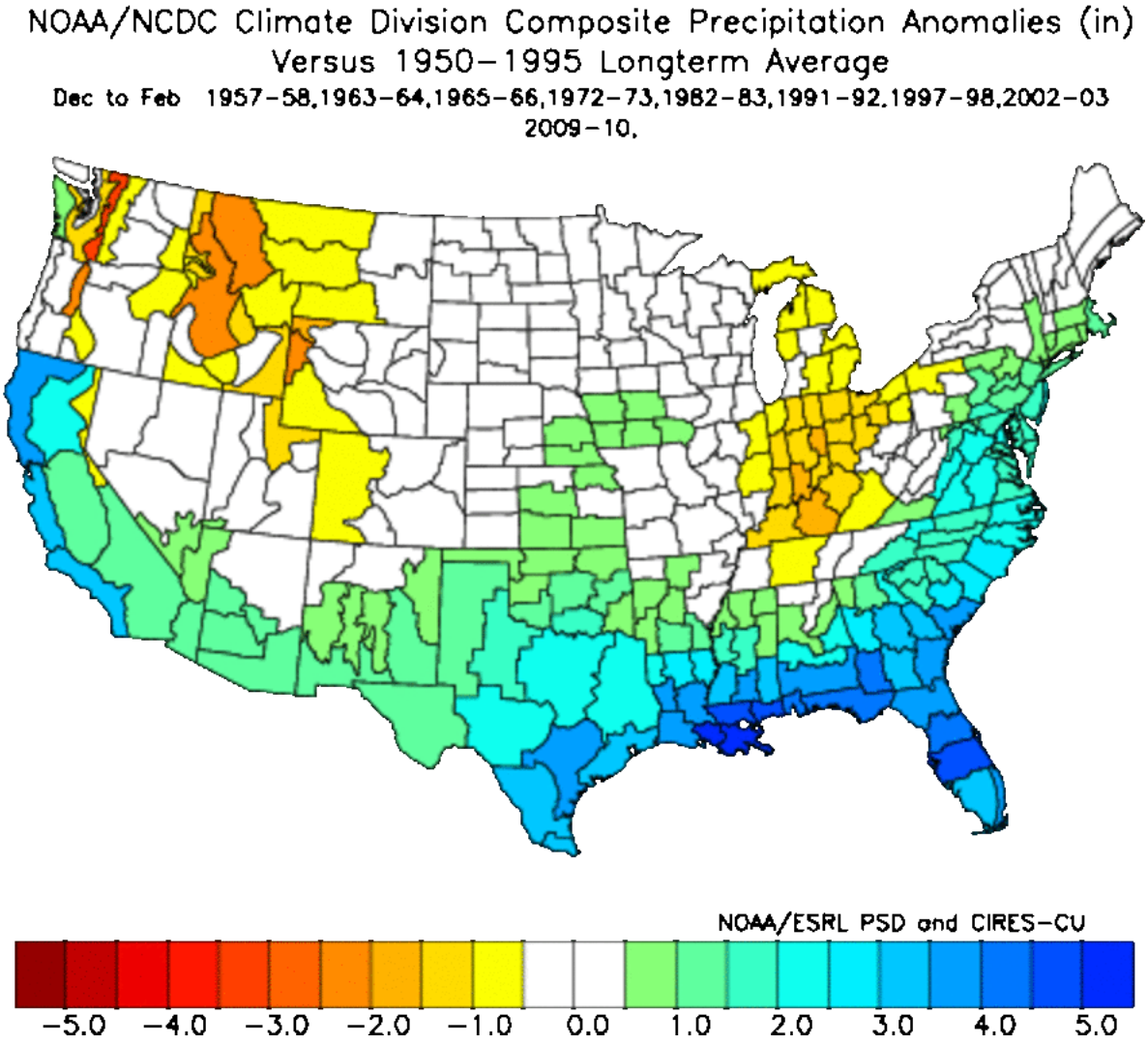
December through February are virtually a lock to produce above average rainfall. Two primary reasons include: (1) "Average" is rather small (above); just one strong coastal low pressure system, or "Texas Nor'easter", could drop 2 to 4 inches across the Rio Grande Valley in a day or two, equaling the average with plenty more opportunities. Those opportunities could come with organized frontal showers, overrunning light rain behind a shallow surface cold front, or a coastal trough/warm front similar to what occurred on November 20th, 2015, when 1 to 2 inches fell around Brownsville – 75 to 100% of the monthly average in a single day

from a non-descript weather system; (2) The combination of a strongly positive Pacific-Decadal Oscillation , the most persistent since the El Niño of 1997/98, with continued above average water temperatures along the entire U.S. and Canadian Pacific coast, especially along Baja California, should help preserve high latent heat levels for upper level disturbances that move through the subtropics, and (3): Just how cold will the southwest Gulf of Mexico get this winter? While below average temperatures (below) are predicted for December-February, the lack of a robust "push" of Canadian air masses through late November has ensured that above average temperatures will likely be the rule for October-December, which was opposite of the early to mid-autumn preview. Point (3) is a true wild card and, should average to above average temperatures rule the winter, the potential for a record-setting cool season (October–March) increases dramatically.

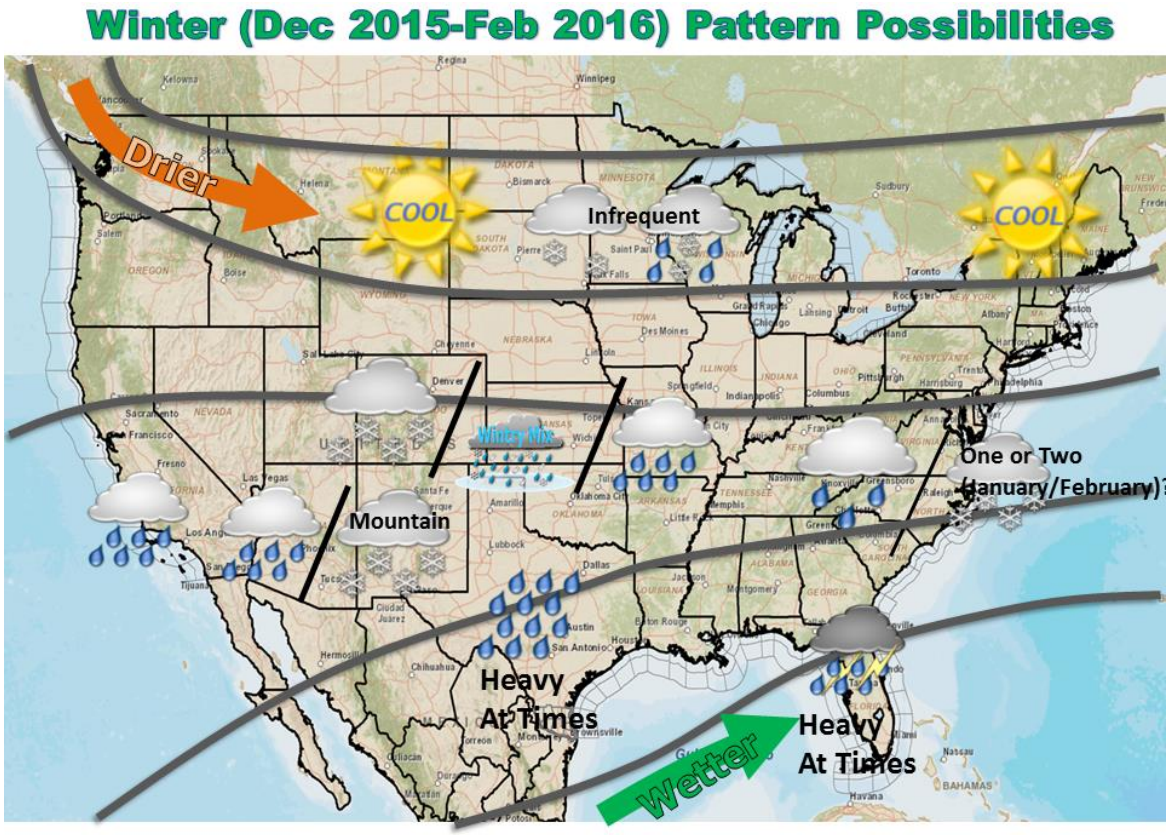


Above: Record weekly Sea Surface Temperature departures (anomalies) for the "Niño 3+4" region, along the equator roughly between 160° and 120°W Longitude, as of November 23, 2015.

El Niño is the "big gorilla" in the background that overwhelms all other teleconnections. Those teleconnections, however, can combine with the aforementioned positive-phase PDO and warm Pacific Ocean to help dictate periods of dry or wet weather. Most prominent is the Madden-Julian Oscillation (MJO), which often "amps up" the tropics and subtropics, and was a prominent driver of the late October Texas floods, which extended from East and Central Texas through portions of the Rio Grande Valley. If the active phase of the MJO can combine with favorable steering patterns at one or more points between December and February, a one to two week period of considerable rain is likely somewhere in South Texas. The map at the bottom of the next page indicates just how much rain has fallen, compared with average, in similar El Niño developments and strengths during the December-February period since 1950.



Above: Precipitation departures for analogous El Niño (moderate to strong) development years when compared with 2015/2016. For the Rio Grande Valley, one would expect 3 to 4 inches above average for December-February; average is 3 to 4 inches, which means a ***doubling of the three month winter average***, all things being equal.

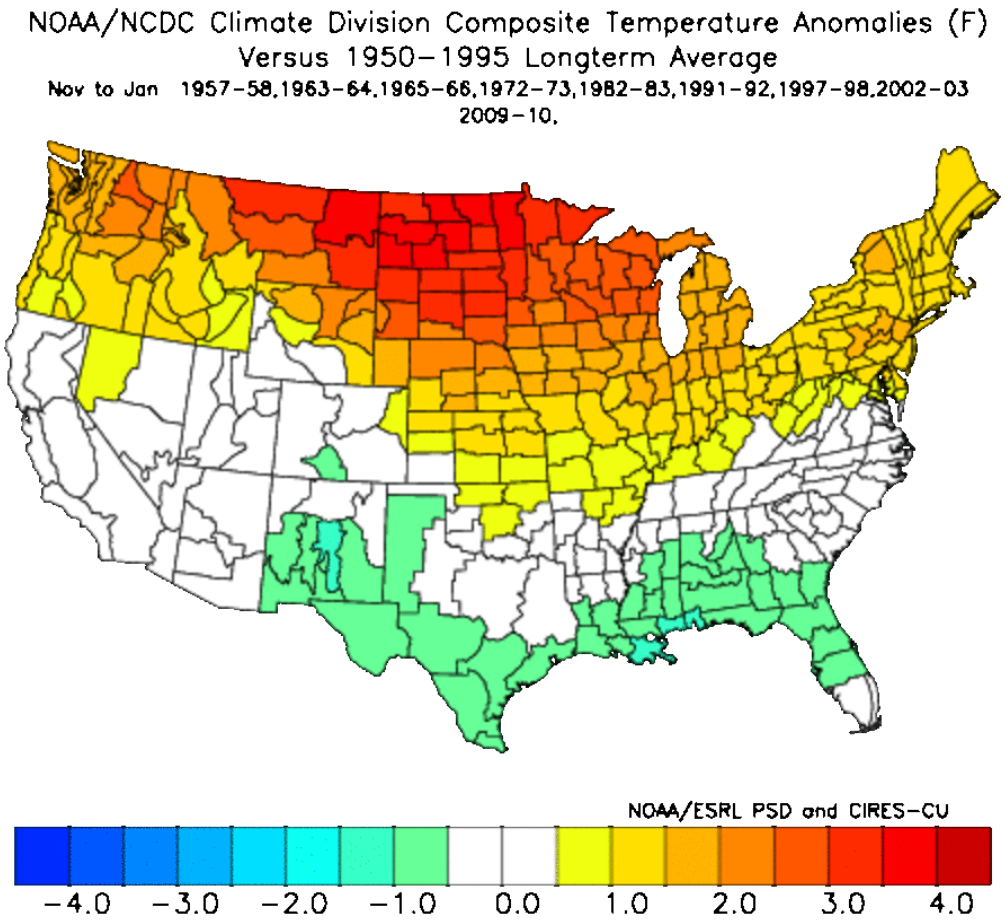


Pattern Matters

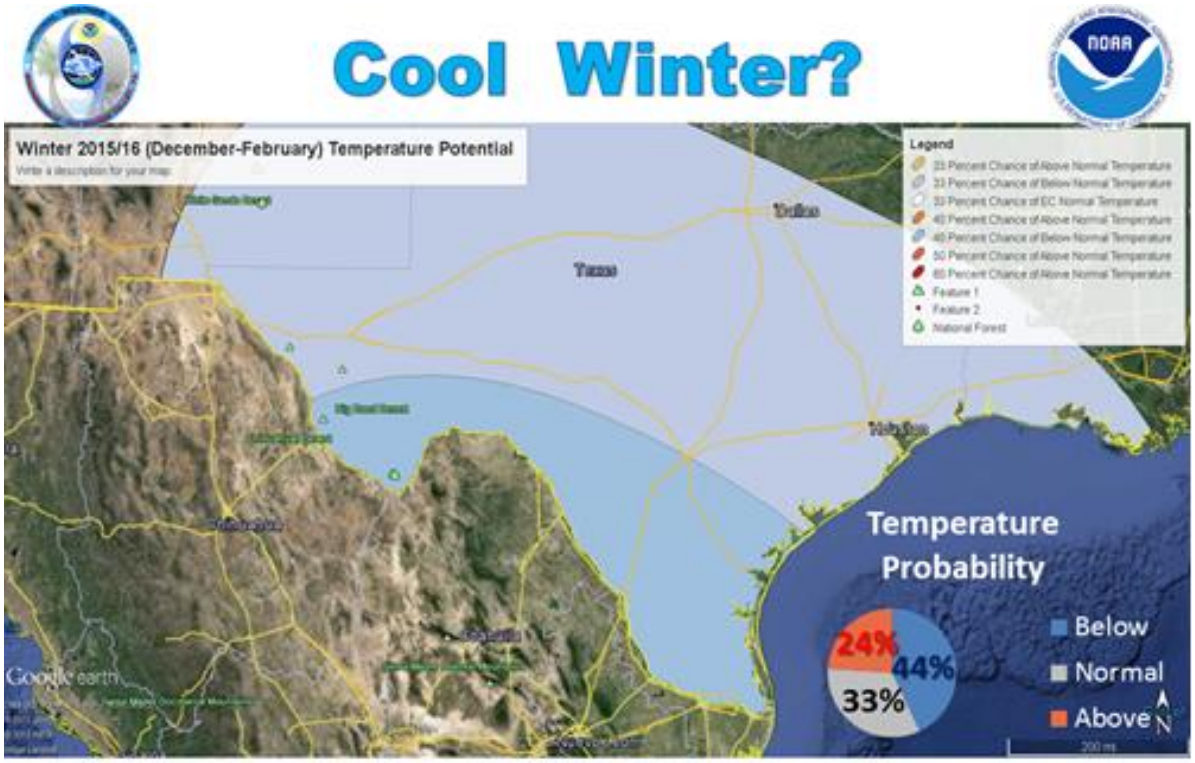
If you recall the November 2015-January 2016 Outlook, the steering pattern map above differs little. The primary change was to remove the California ridge of high pressure and replace with a general west to east flow which would occasionally pick up deep tropical moisture and bring occasional to frequent heavy rain episodes to California and Baja California. The disturbance would pick up additional energy from the tropical Gulf of Mexico and Caribbean and dump the heaviest rains on central Florida, which has a **70 percent or greater** probability of above average rainfall and near zero probability of below average rainfall between December and February. Florida floods from rainfall may be one of the memorable stories by the time winter ends – but we can't rule out other areas of concern anywhere along the Gulf coast, which includes the Lower Rio Grande Valley through Louisiana and the Florida Panhandle. As mentioned in the November-January outlook, the possibility of a "super soaker" (a foot of rain in four hours) does not exist. However, with water levels and the water table/aquifer still at capacity, even a "slow soaker" in the Lower Valley may re-ignite notable flooding in poor drainage locations.

As for temperatures, El Niño episodes dating back to 1950 continue to indicate temperatures about 1 to 2°F below average, which matches with the forecast expectations above. The cooler than average forecast does not necessarily translate into a better chance for a freeze or any freezing/frozen precipitation. In fact, the chance for a hard freeze is slim to none based on prior El Niño episodes, largely due to the dominance of the injection of eastern Pacific tropical moisture into the systems that dive south and tap it.

One cannot rule out a late December or January freeze. The key puzzle piece would be the development of a persistent negative phase North Atlantic or Arctic Oscillation (NAO/AO). Such was the case in January 2010, when a hard freeze struck much of the Valley on the 9th and 10th. As of late November, the NAO continued to tend neutral to positive; such a trend into December and January would guarantee no hard freezes for the Valley. The NAO, however, only has predictability out about two weeks. A pronounced and prolonged shift during the heart of winter would increase the threat for a freeze/hard freeze. Stay tuned!



Above: Temperature departures from average during winters (December-February) with El Niño development similar to 2015/2016.



Note: Average Temperature For Period (RGV): Approximately 63°F
Daytime: ~73°F, Wake-Up: ~53°F.

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.*** December through February could 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.

  It's always a good time to check roofs and walls for leaky areas and repair, and 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.*** Each fall and winter, sharp changes in air masses from balmy breezes to biting chill are a hallmark for the Valley. While the number of very sharp changes (dipping 40 to 60 degrees lower from one day to the next) probably won't rival that of the fall/winter of 2013/2014, to see one or two such events anytime from late November through January would not surprise. Be ready to change from spring/summer clothes into winter jackets, sweaters, and the like in a matter of hours when the season of "gray 'northers" begins. 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 during December. There are no certainties, however; atmospheric "teleconnections" such as the North Atlantic/Arctic Oscillation could become a player in cold air intrusion by late December, especially if a significant negative phase develops by November or early December.