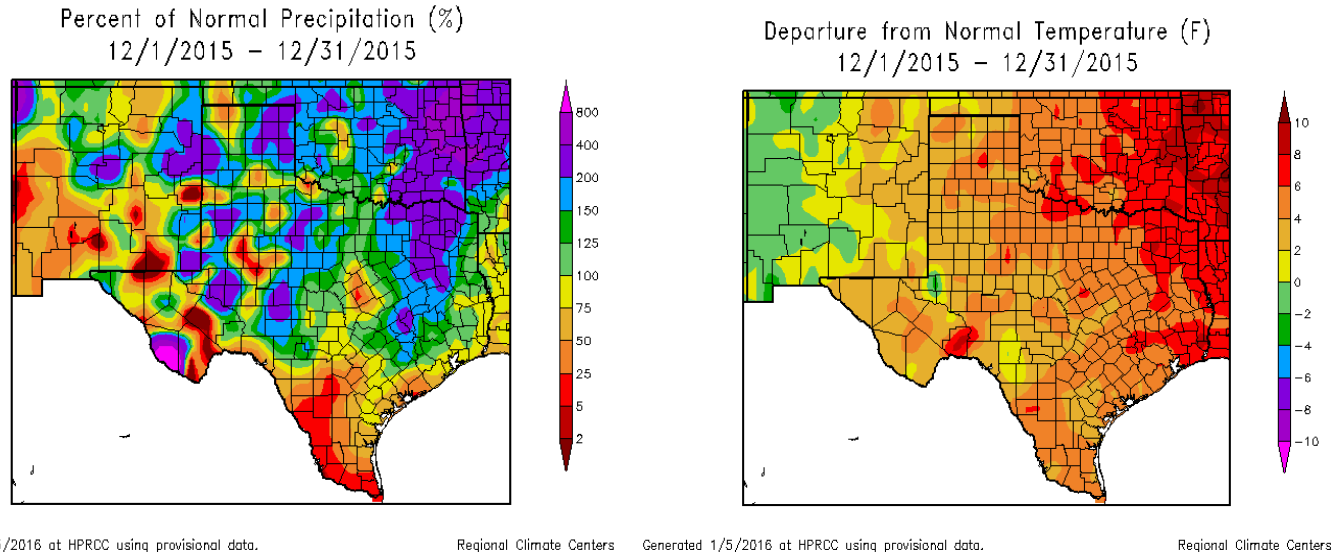
December 2015 Quick Summary

Location	Average Temp.	Departure	Rank (Prior Rec)	Since
South Padre Island	69.3	+5.9	1 (N/A)	1992
Falcon Dam	65.6	+6.5	2 (66.7/1984)	1962
McAllen/Miller	67.2	+5.2	5 (69.4/1984)	1961
McAllen/Cooperative	65.9	+5.4	8 (68.1/1970)	1941
Brownsville/SPI Arpt	67.2	+5	9 (71.2/1889)	1878
Harlingen/Cooperative	65.8	+5	9 (68.5/1970)	1912
Port Mansfield	63.0	+2.5	10 (67.6/1984)	1958
Rio Grande City	62.5	+3.9	15 (66.1/1984)	1897

Warm, Humid, But Largely Rain-Free

Summer-Like Humidity Hangs Tough through Christmas 2015 for RGV

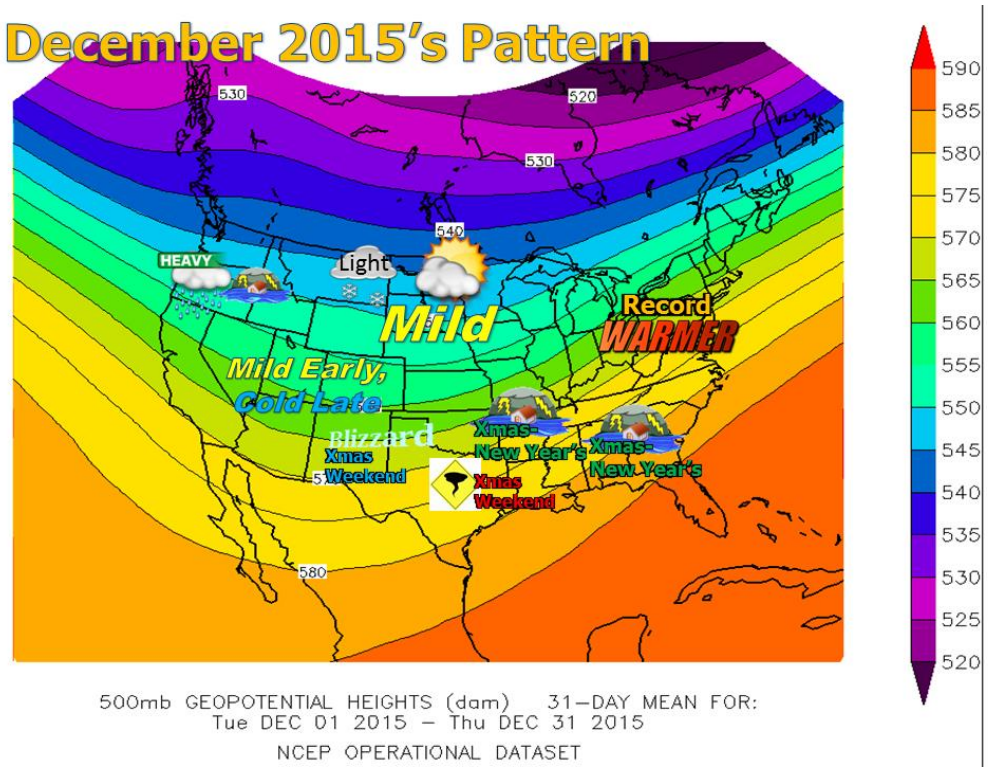
Even as the calendar turned toward winter and the days grew shorter, late spring to even early summer-like warmth and humidity dominated nearly all of December. While low level moisture was ever present, the best "lift" in the atmosphere remained well north of the Rio Grande Valley, and rainfall was limited to less than an inch across the King Ranch, and less than half an inch elsewhere – just 10 to 25 percent of the typically dry average. Increased rainfall was noted the farther north went in Texas, in line with the closer proximity of atmospheric cyclone (disturbance) tracks. Compounding the situation was a general westerly, or "downslope" flow several thousand feet above the surface to the south of the atmospheric disturbances which scoured out necessary moisture to produce precipitation. Nearly every long term station of record ended among the top ten warmest (table, above), but the low precipitation also placed most stations among the top 20 driest (data not shown).

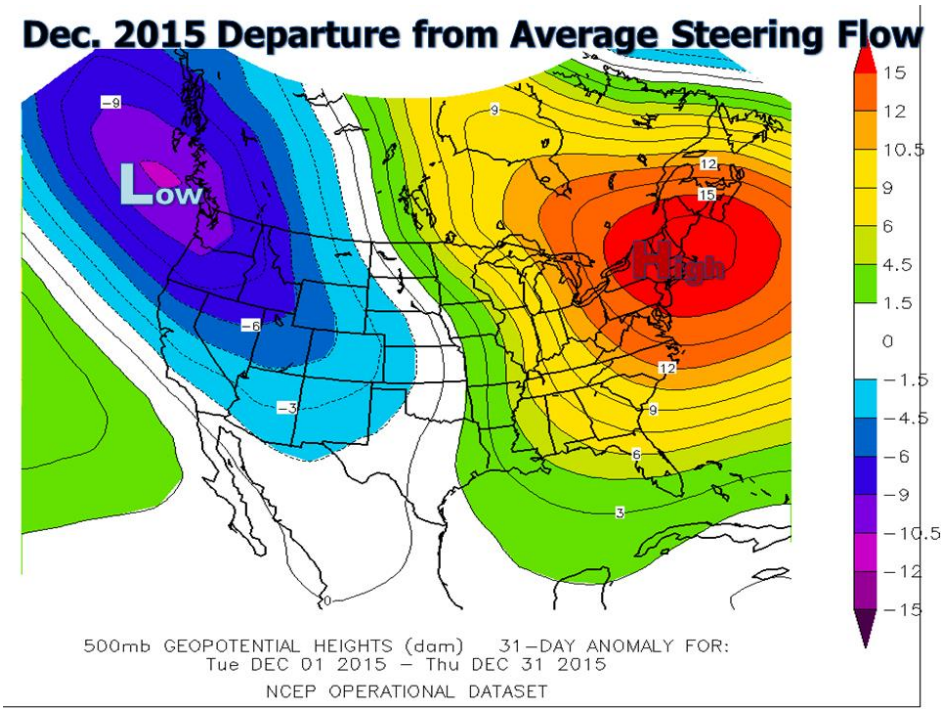


Above: *Left* – Percentage of normal precipitation for Texas, New Mexico, and Oklahoma in December 2015. *Right* – Departure from Average Temperature for December 2015. While precipitation ended up near or above average for much of Texas, the Rio Grande Valley missed most of the action. Nearly all of Texas, however, was substantially above average for the month.

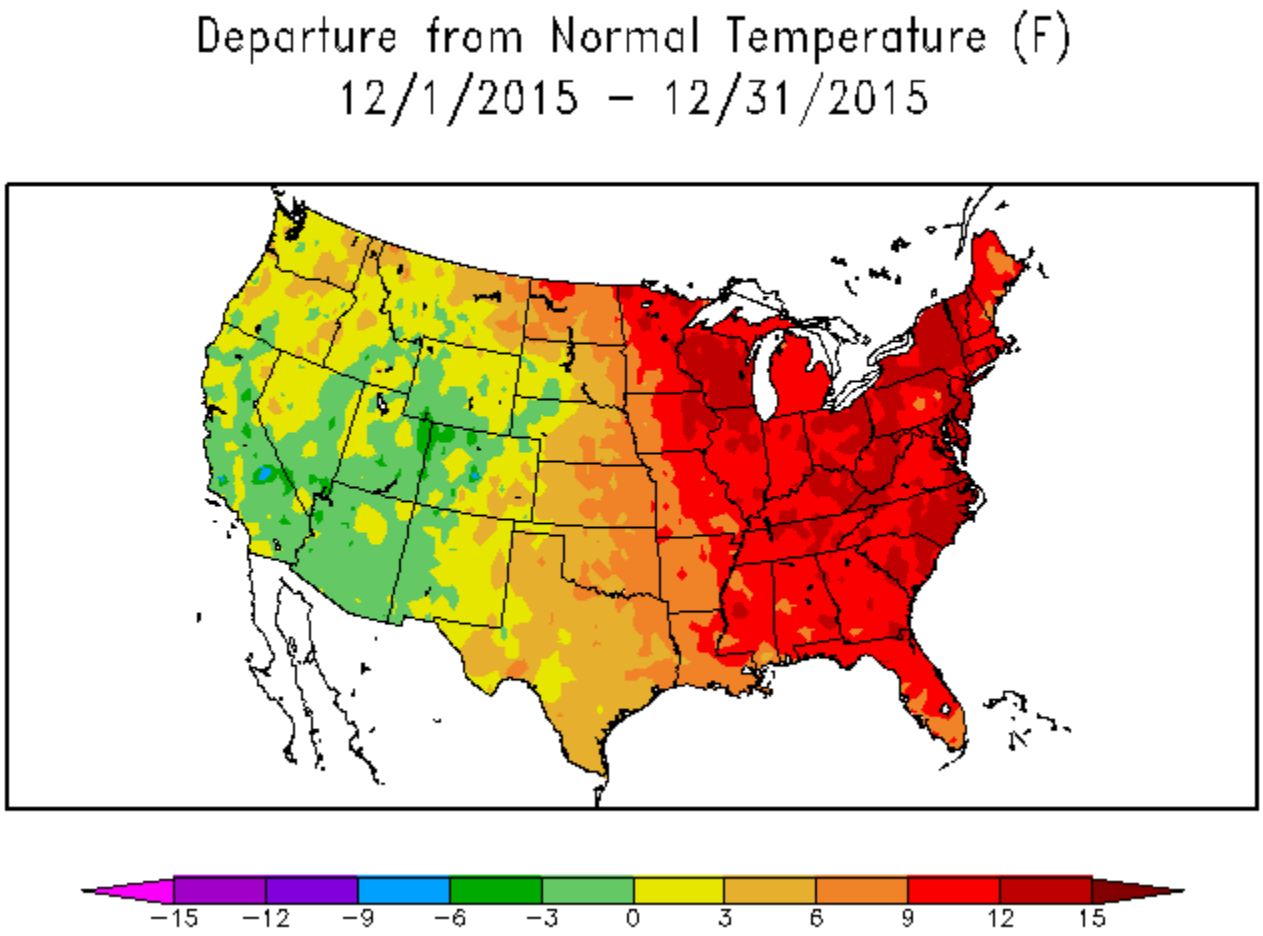
Pattern Matters

The mean steering flow (top of next page), and the departure from December averages, told the tale. For the eastern half of the country, highly anomalous upper level ridging shattered hundreds of prior warm temperature records in December 2015, in some cases by 3 to 5°F! Texas was on the back side of the anomalous departures but still in "front" of the cooling western U.S. trough; this led to a prolonged flow of subtropical and tropical air masses, sometimes assisted by the very warm eastern tropical Pacific Ocean that was in record El Niño territory to begin the month. The increased humidity and cloud cover kept nights much above average and the warmth of the source air mass kept days fairly warm as well, clouds or not.





The Rio Grande Valley was influenced by the back edge of the core of the upper level ridge (located near Cuba and to the right of the top image) to "wave" to the wetter events to the north. Those events culminated in a "Christmas Crush" of hazardous events, led by the Garland/Rowett tornado on December 26th, but also a crippling blizzard into the 27th that buried tens of thousands of cattle in west Texas and eastern New Mexico. The same system caused widespread creek and river flooding in Arkansas and Missouri, and produced very heavy rainfall across the southeast U.S. Out west, flooding rains crashed into Oregon and Washington early in the month, setting the tone for monthly totals that would range up to 35 inches along the southwest Oregon coast, up to 15 inches above an already wet normal. While El Niño was the 800 lb. gorilla in the room, other factors, including exceptionally warm subtropical and temperate eastern Pacific waters and a persistently positive Arctic and North Atlantic Oscillation, were likely key puzzle pieces to a Holiday period where Santa spent more time on a surfboard than a sleigh in the USA.



Above: Note the remarkable "match" between the exceptionally warm eastern half of the U.S., and relatively cool western U.S., with the steering flow departure from average graphic on page 2, above.