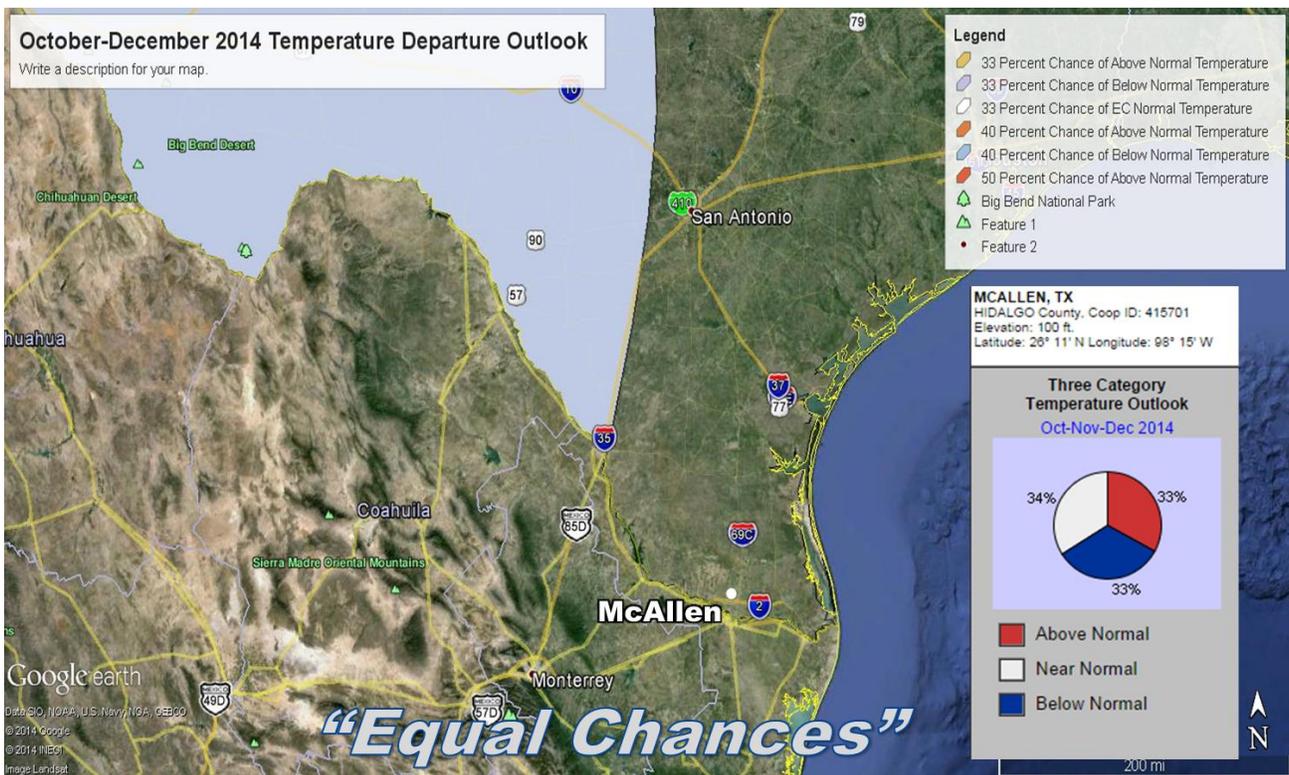
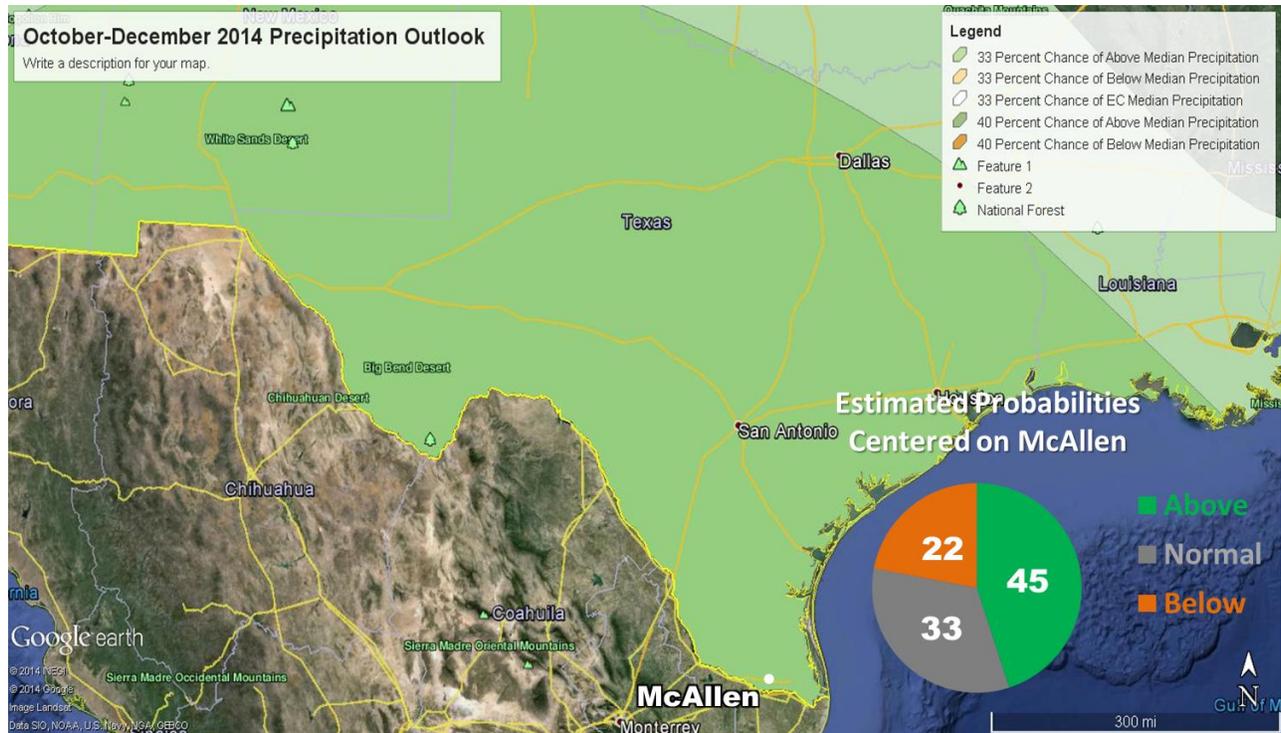


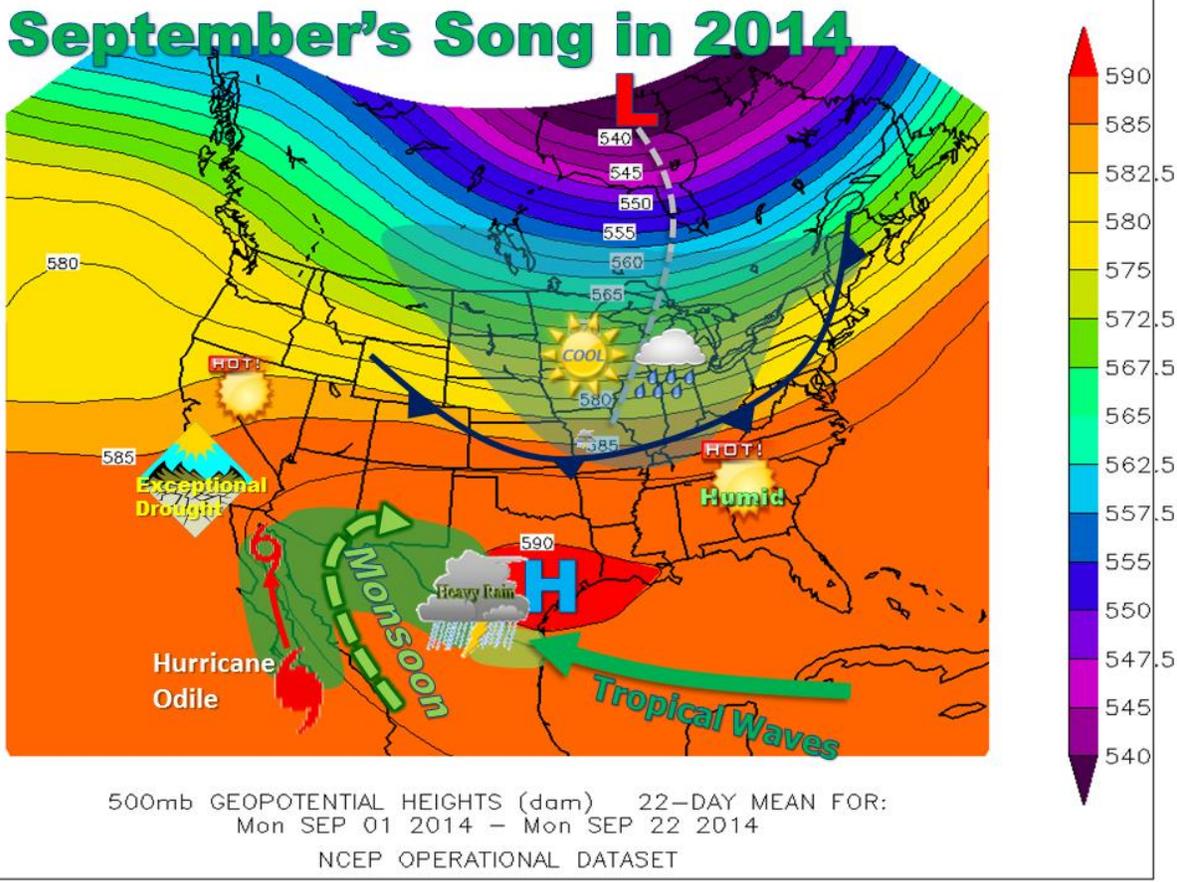
October-December 2014 Outlook



Will Wet Trend Continue through December in RGV? Potential for Weak El Niño Brings Hope for More Rain, but No Guarantee

September 2014 more than lived up to the month's billing as a hot, humid, *and wet* month; as of the 24th, Valley-wide rainfall totals had surpassed those of [September 2010](#), were level with those of June 2010, and

would eventually become the wettest month across the Hidalgo/Cameron/Willacy region since July 2008, when [early month heavy rains](#) combined with [Hurricane Dolly](#) to drop [15 to 25 inches of rain](#). In summary, September's wild card turned to an ace for rain and a deuce for drought, which was eliminated for nearly all of the RGV by late month. The prevailing pattern and general weather trends from September 1-22 are shown below.

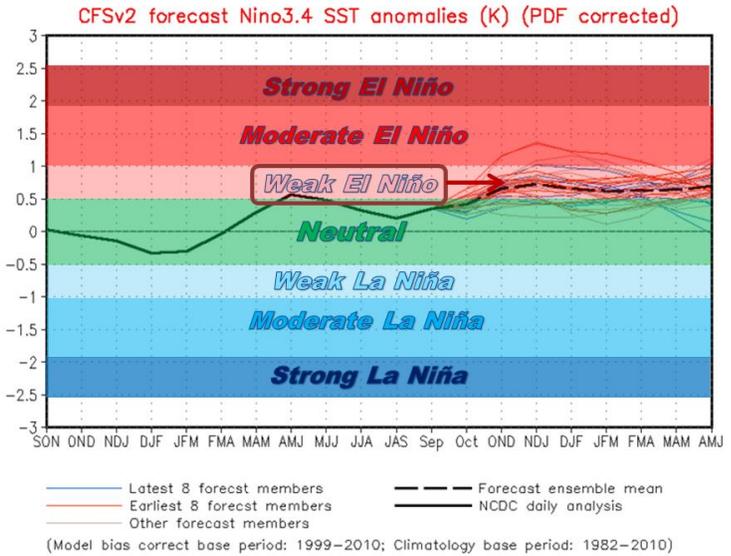


Above: Average “jet stream” (black lines) and resultant weather for the Lower 48 from September 1-22, 2014. Note the position of the core of the subtropical ridge (blue H) over southeast Texas. Persistent flow and waves from the southern Gulf/Caribbean Sea brought drought-breaking rainfall to the RGV (green arrow), while monsoon moisture and the remnants of Hurricane Odile brought flooding rains along the Rio Grande west of Presidio, Texas. The season’s first significant cold fronts cooled the Midwest and northern Plains.

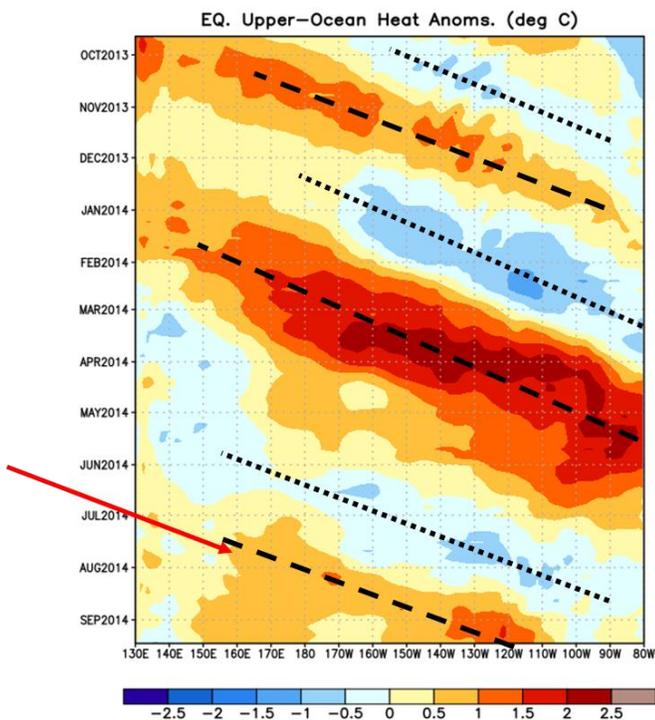
For the remainder of autumn and into early winter 2015, some of the questions were: Is more rain coming? Is the long term drought finally over? We try to answer them here.

El Niño: Hit, Miss, or Something In Between?

As mentioned in the [Autumn \(September through November\) Outlook](#), confidence had diminished for the development of El Niño, and was expected to drop a bit further by the start of October 2014. The possibility of a more formidable moderate or strong El Niño (chart, right) had dropped sharply but could not be ruled out completely.



Enough confidence remained, however, to forecast a weak El Niño episode, based on late

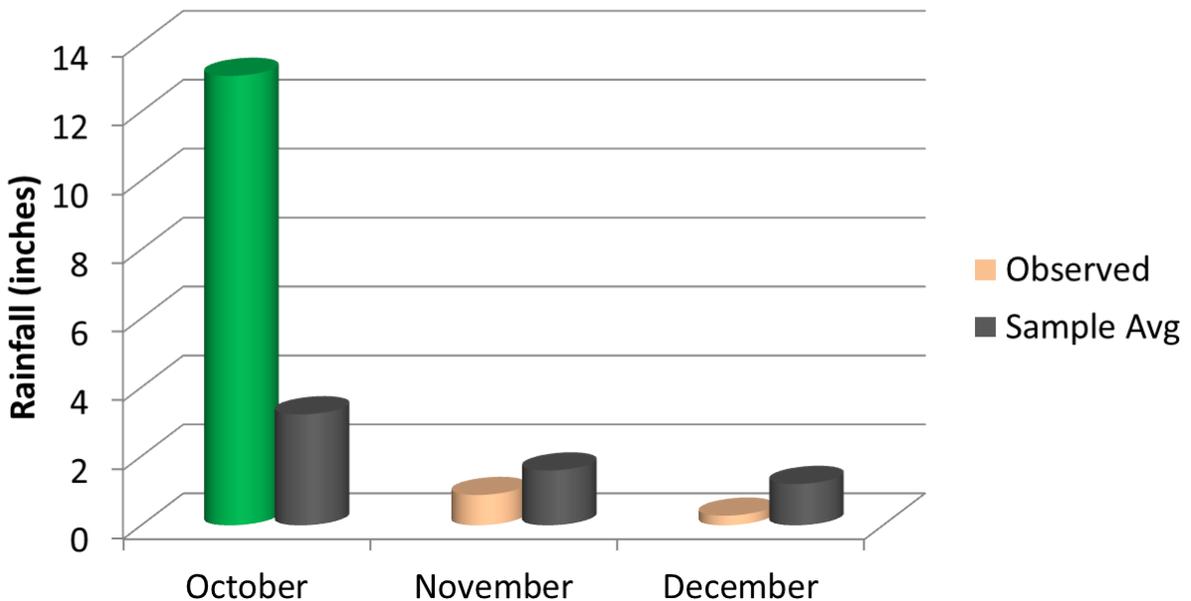


summer/early August trends that returned warmer sea surface temperatures and, more importantly, subsurface waters (indicating downwelling). September was expected to end above the 0.5°C benchmark, with further slow rises into October and November. A second downwelling (warming) Kelvin Wave phase began in late summer and appeared to be peaking in September (left, see red arrow). While not as strong as the early 2014 wave that kicked up the El Niño expectation (red/maroon areas), this second warming arrived after minimal cooling (light blue with black dashed line overlay) associated with an upwelling period in early summer, when compared with more robust cooling late autumn 2013/early winter 2014.

The presence of El Niño during the end of autumn and start of winter (December) favors the opportunity for above average rainfall and slightly below average temperature, as shown in these [charts \(leftmost bar for Brownsville, Harlingen, and McAllen\)](#). El Niño alone does *not* guarantee a wet late autumn/early winter. In October 1997, heavy rainfall associated with the last of the season's tropical waves dropped 5 to 10 inches near the Lower Texas coast, and was followed by a slowing cold front that dumped another 4 to 7 inches in

some of the same areas. None of these events can be related to the presence of an El Niño. In Brownsville, more than 12 inches fell before October 15th. The spigot shut off soon after; less than an inch fell from the 14th through 31st, and barely more than an inch fell in November and December, nearly one-third the average of nearly 3 inches for that period (below). During this time, El Niño was at full steam, well into the "strong" category (Oceanic Niño Index above 2).

Oct-Dec 1997 Rainfall Compared to 100+ Year Average Brownsville, Texas



Other short term atmospheric puzzle pieces, such as trends in the [Arctic Oscillation](#) and [North Atlantic Oscillation](#), as well as the phase of the [Pacific Decadal Oscillation](#), will have something to say about individual rainfall events as autumn turns to winter.

Bottom line? We're hopeful for more welcome rainfall that can continue to replenish RGV soil moisture deficits, but confidence for a wet vs. "normal" – or even dry – October to December period is 50/50, at best.

Reservoir Relief?

The rainfall that soaked the Valley in September did not have a similar impact on nearby reservoirs in Mexico or the United States, particularly Falcon International Reservoir and to a lesser degree Presa El Cuchillo and Presa Marte Gomez in northern Tamaulipas. The heaviest rains from [Tropical Storm Dolly](#) nestled into the Sierra Madre south of the Rio Grande basin in early September; other weak tropical/easterly waves pushed some moisture up the foothills north of Monterrey, but well short of the amount of rainfall necessary to runoff into Falcon. The September 2014 rainfall allowed levels to remain steady, and by the end of September, the ~22% was among the lowest for this time of year since the big drop in late 2011.

Many of the torrents from Hurricane Odile bypassed the [Rio Conchos basin](#) in northern Mexico. However, some of the more than 10 inches of rain that fell near the Rio Grande between Presidio and El Paso, combined with additional water from reservoirs in the Rio Conchos, had increased the conservation storage to over 1 million acre-feet (Texas share) at Amistad International Reservoir, with percentage full approaching 60% by the last week of September. These levels were the highest since the drought and release drop off of late 2012.

Falcon Reservoir is 22.2% full as of 2014-09-24



| | Date | Percent Full | Water Level (ft) | Height Above Conservation Pool (ft) | Reservoir Storage (acre-ft) | Conservation Storage (acre-ft) | Conservation Capacity (acre-ft) | Surface Area (acres) |
|--------------|------------|--------------|------------------|-------------------------------------|-----------------------------|--------------------------------|---------------------------------|----------------------|
| Today | 2014-09-24 | 22.2 | 268.18 | -32.92 | 710,785 | 344,600 | 1,551,007 | 36,620 |
| Yesterday | 2014-09-23 | 22.2 | 268.15 | -32.95 | 709,653 | 344,051 | 1,551,007 | 36,584 |
| 2 days ago | 2014-09-22 | 22.2 | 268.13 | -32.97 | 709,135 | 343,800 | 1,551,007 | 36,567 |
| 1 week ago | 2014-09-17 | 21.6 | 267.90 | -33.20 | 700,924 | 335,202 | 1,551,007 | 36,302 |
| 1 month ago | 2014-08-24 | 22.5 | 268.39 | -32.71 | 717,995 | 348,873 | 1,551,007 | 36,853 |
| 3 months ago | 2014-06-24 | 31.4 | 271.63 | -29.47 | 840,663 | 487,086 | 1,551,007 | 40,581 |
| 6 months ago | 2014-03-24 | 40.4 | 276.95 | -24.15 | 1,077,882 | 627,045 | 1,551,007 | 47,072 |
| 1 year ago | 2013-09-24 | 23.4 | 264.30 | -36.80 | 579,384 | 362,514 | 1,551,007 | 32,276 |

Temperature Trends

October typically sees the first refreshing front of the young autumn, sometime between the 1st and 15th of the month, and 2014 should be no exception. Thereafter, the “sense” of each successive front will depend on short term patterns. Any hint or development of a jet stream of energy waves across the southern U.S., perhaps dipping into northern Mexico by late November into December, will increase the likelihood of chilly “gray ‘Northers” where surface temperatures hold in the 40s or 50s and periods of drizzle/light rain, along with a stiff north wind that makes it feel like 35 to 40 during the daytime, for a few days at a time.

A December Freeze? Based on El Niño alone, the potential for a killing freeze, similar to the two that occurred around [Christmastime in 1983 and 1989](#), is slim to none; each year had transitioned into, or out of, La Niña. Still, one can't rule out the potential for some type of freeze or frost in December, especially if the negative phase of the Arctic Oscillation/North Atlantic Oscillation become dominant.

The [White Christmas of December 2004](#) occurred during the heart of a weak El Niño, but the event is considered a “one off” when the smaller puzzle pieces of the atmosphere fit together perfectly for the occurrence. We can always dream ☺