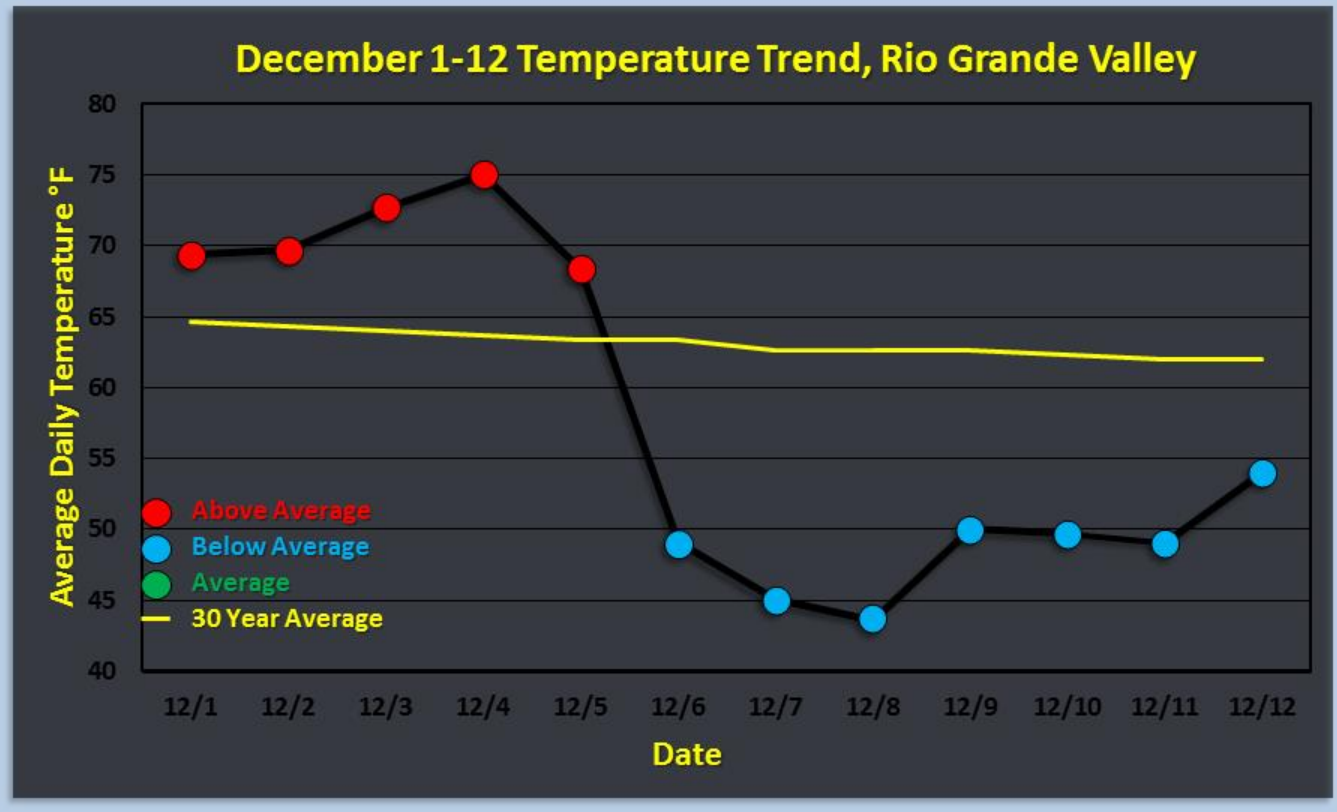
December 2013: Early "Roller Coaster"



Summer to Winter: Déjà Vu?

Early Sunshine and Warmth Turns to Gray Chill for the RGV

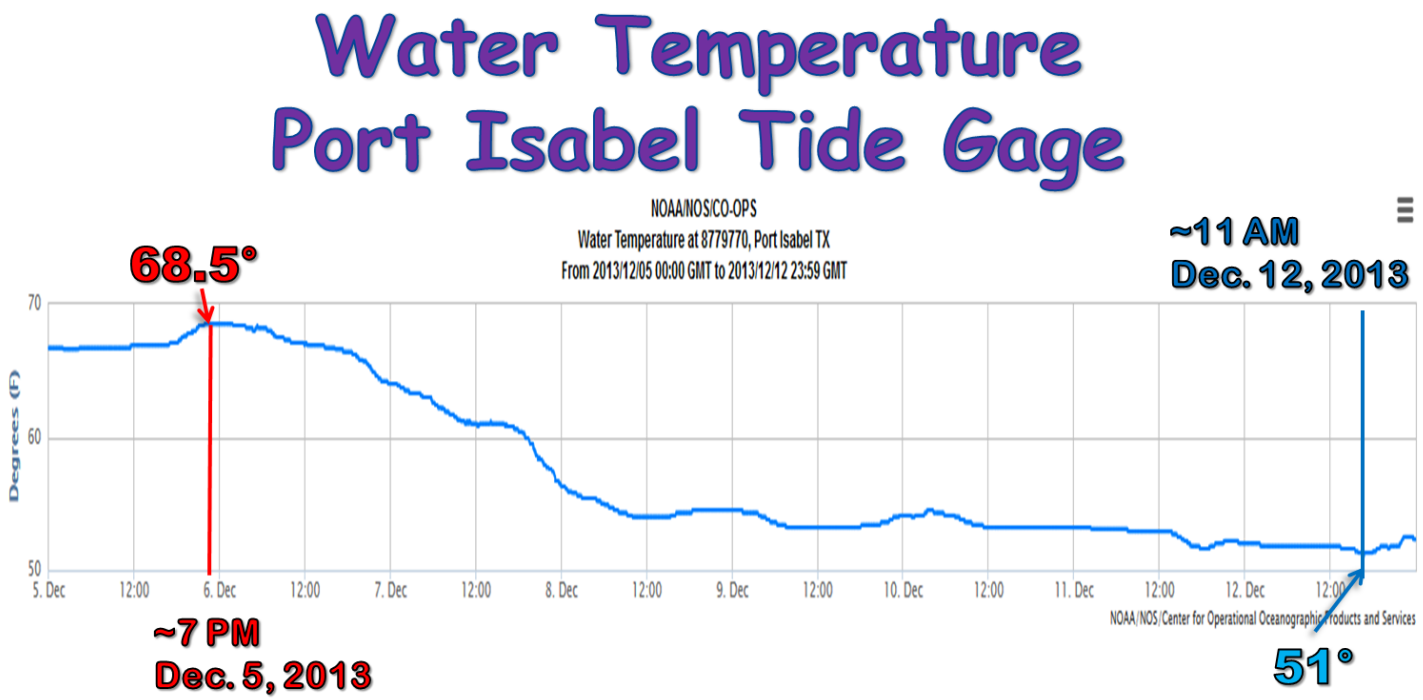
The Rio Grande Valley had seen many times before, and as recently as November 22nd, 2013: Balmy, breezy warm weather sharply undercut by shallow, cold air in short order. Between the afternoon of Thursday, December 5th and the mid-morning of Friday, December 6th, temperatures fell from the mid to high 80s into the lower to mid 40s, including a 49 degree drop in Zapata County (89°F at 4 PM on the 5th to 40°F at 715 AM on the 6th). Adding the chilling 10 to 15 mph north wind, the "feels like" temperature difference was more than 55 degrees!

By afternoon on the 6th, temperatures recovered into 45 to 50° range, only to be followed by a secondary surge of even colder air overnight on the 6th, bottoming out on the first Saturday of December (7th) with morning temperatures ranging through the 30s and "feels like" temperatures, when combining a stiff north wind, ranging through the 20s. Steel gray skies and drizzle pockets kept afternoon temperatures in the mid to high 30s across the ranchlands, and around 40° in the Valley, with "feels like" temperatures ranging from the upper 20s into the lower 30s. Overall, December 7th, 2013 was the coldest *December* daytime since December 4th, 2009, for the Lower Valley (Cameron, eastern Hidalgo, Willacy County).

Modest moderation of the air mass brought daytime temperatures into the 40s (ranchlands) to around 50 (Valley) on the 8th, with 50s and lower 60s arriving for the 9th before another surge arrived overnight. Daytime temperatures on Tuesday the 10th held in the 40s toward the coast, but recovered into the 50s across the Upper Valley and ranchlands, where the sun returned after four days in hiding. A final weak surge of chilly air

held daytime temperatures mainly in the 50s on the 11th before a slow moderation toward 60° on the 12th. The north winds finally abated overnight on the 12th, and partial sunshine, south winds, and warmer temperatures returned on Friday the 13th. For much of the Valley, the sun's return on the 13th ended a seven-day period of steel gray skies, brisk north winds, and occasional drizzle and mist.

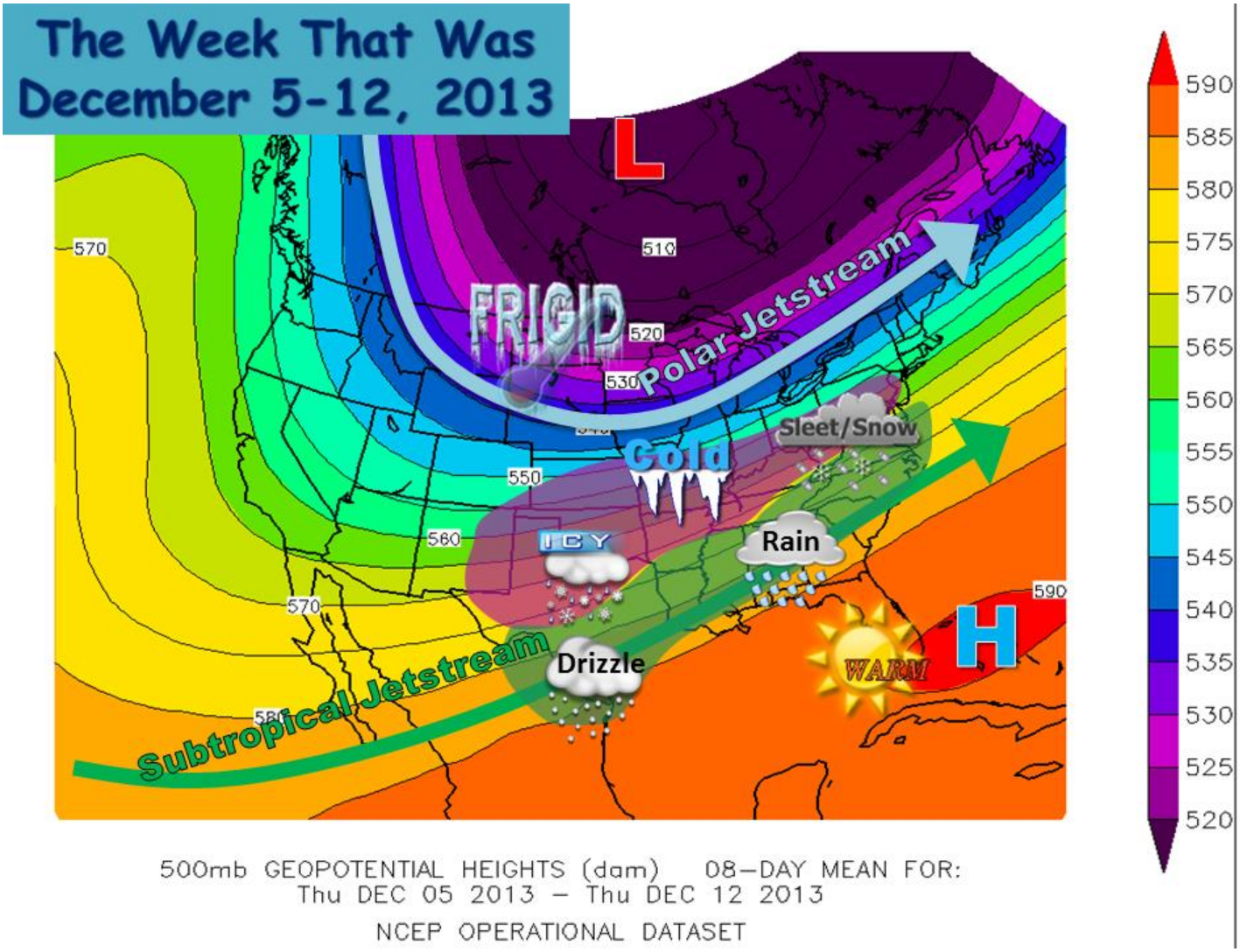
The prolonged cold spell tumbled surf and bay water temperatures to values not seen since February 2011. The lowest surf temperature was measured at 53°F, Laguna Madre Bay 51°F (image below), and the upper reaches of the Laguna Madre just above 50°F on December 12th. The chilled surf and bay caused some stress to sea turtles; more than 100 of them were stranded while seeking relief from the cold water, and four died. Other native sea life was likely stressed by the cold water. The sea turtle rescue was the highest since February 3, 2011, when 330 turtles were stranded under water temperatures in the mid to high 40s.



Reasons for the Season(al) Change

Frigid air pooling across the arctic and subarctic regions of eastern Alaska and northwest Canada broke loose and surged into the northern Rockies and High Plains soon after the calendar turned to December, aided by a buckling jet stream (below) which opened the dam. Sub-zero average temperatures surged across the front range of the Rockies, the northern and central High Plains, and spread into the upper Midwest between the 5th and 7th. While the entire atmosphere chilled across these regions, the depth of the cold air thinned across the Lower Plains and Mississippi Valley. Shallow cold air – the "wedge" – often outruns any support from the jet stream. This air is much more dense than the air it displaces. This wedge of slowly modifying raced across all of Texas and well into northern Mexico, and oozed across the Ohio Valley and into the Deep South U.S. Upper level disturbances riding the subtropical jet stream overtop the cold air produced myriad precipitation across Texas and points east. Significant icing and sleet summarily shut down the Dallas-Fort Worth Metroplex between the 6th and 10th before melting began in earnest on the 11th. A band of heavy snow created a winter wonderland of football in Philadelphia on the 8th.

The bulk of the upper level energy bypassed the Rio Grande Valley, but plenty of moisture from 6-8 thousand feet to several hundred feet above the ground, primarily from the tropical Gulf, overran the cold surface and kept the weaker December sunshine from making much more than a fleeting appearance between the 6th and 12th.

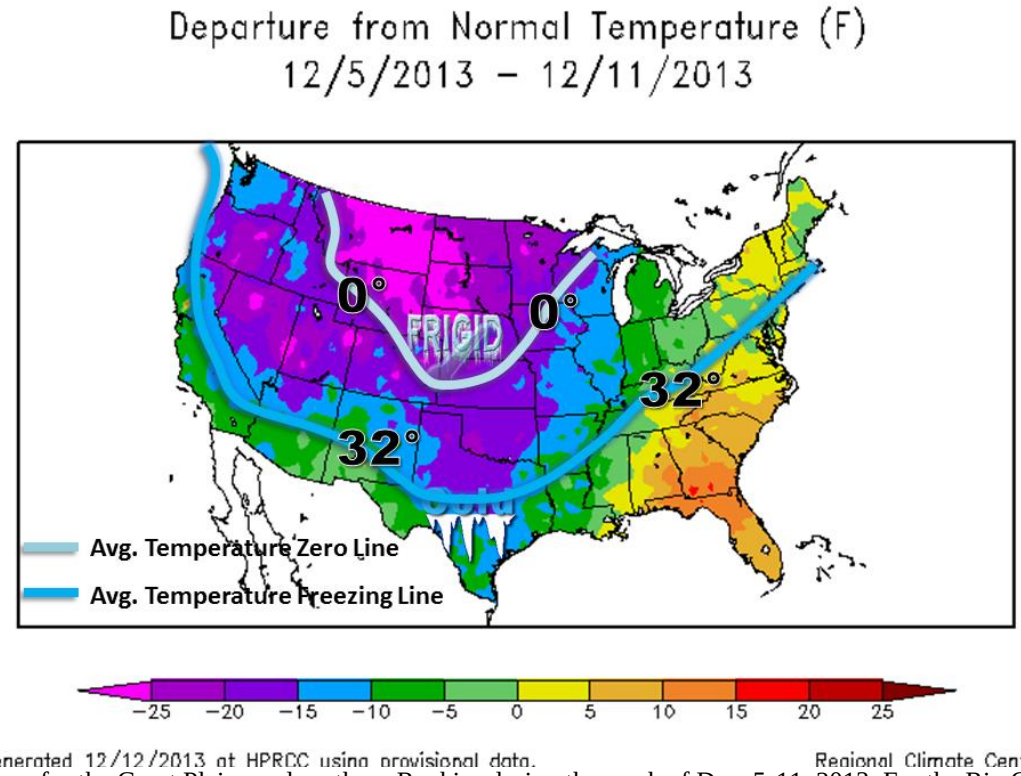


By the Numbers

The sharp temperature change showed up prominently (top of this article) when comparing the first five days (Dec. 1-5) with the next seven (Dec. 6-12). The change from "summer" to winter, using Brownsville, Harlingen/Valley, and McAllen/Miller (airports), is described in the table below (based on 1981-2010 30 year average):

Location	Dec. 1-5 Avg.	Dec. 6-12 Avg.	Period Change	Dec 1-12 (total avg)	Total Change
Brownsville	**+8**	**-13.4**	**-21.4**	**-4.6**	**-12.6**
Harlingen/Valley	**+7.6**	**-13.3**	**-20.9**	**-4.7**	**-12.3**
McAllen/Miller	**+4.4**	**-14.6**	**-19.0**	**-6.8**	**-11.2**

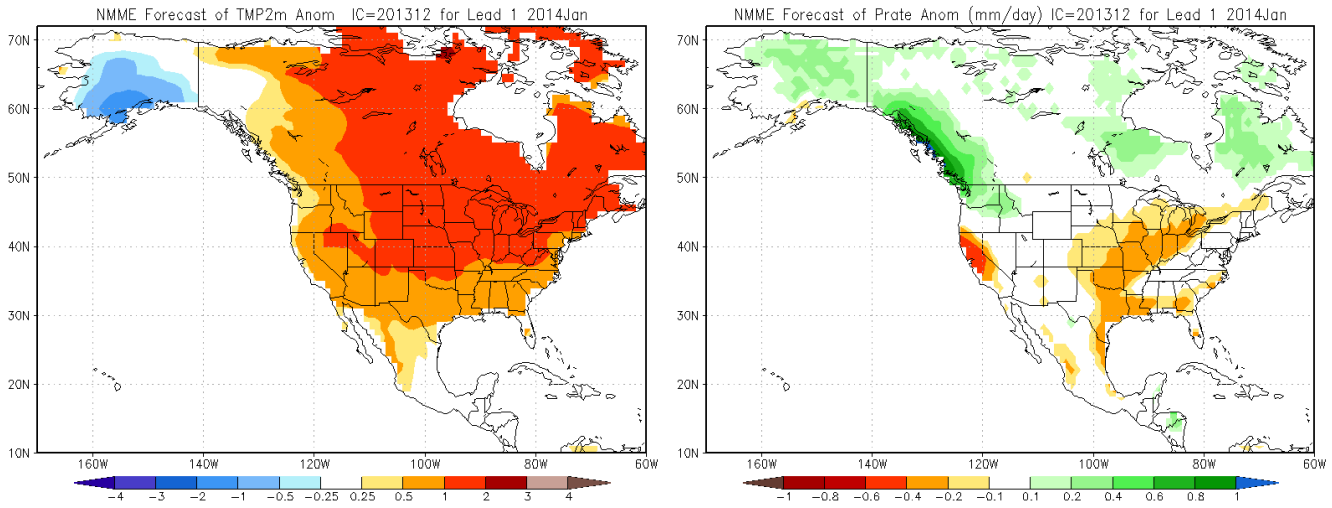
With more than a third of December complete, temperatures generally from 4.5 to 7 degrees below average, and at least two more cold fronts on the way through Christmas week, a below average month is becoming a certainty. Warmer stretches during the last half of the month will bring the value closer to zero, but in all likelihood, the Valley will finish December somewhere between 1 and 3 degrees below the 1981-2010 average.



The frigid story for the Great Plains and northern Rockies during the week of Dec. 5-11, 2013. For the Rio Grande Valley, temperatures averaged in the high 40s to around 50, 10 to 15 degrees below the weekly average for the period.

More of the Same On the Way…or a Pattern Change Coming?

Each front from late November through December 11th was followed by (or maintained) low overcast with periods of light rain or drizzle. As of the 12th, area wide rainfall had not amounted to much; less then 0.10 inches was generally less than 25% of normal through that date. Model trends through Christmas week had turned in favor of blustery but dry fronts, with limited to no rain along them. This could be the start of a trend for the rest of the winter (December 2013 through February 2014) period. The most recent projection of the National Multi-Model Ensemble (NMME) forecast (next page) shows generally warm and dry conditions for south Texas. More impressive are the projections from all models for January, suggesting the arctic air surging into the Great Plains during December may be a distant memory to start 2014. Stay tuned!



Above: One month long-lead forecast for January 2014 by the National Multi Model Ensemble for temperature (left) and precipitation (right). Notice the trend toward above to much above average temperatures across much of the continental U.S. (less across the Rio Grande Valley), and somewhat drier than average across the nation's midsection.