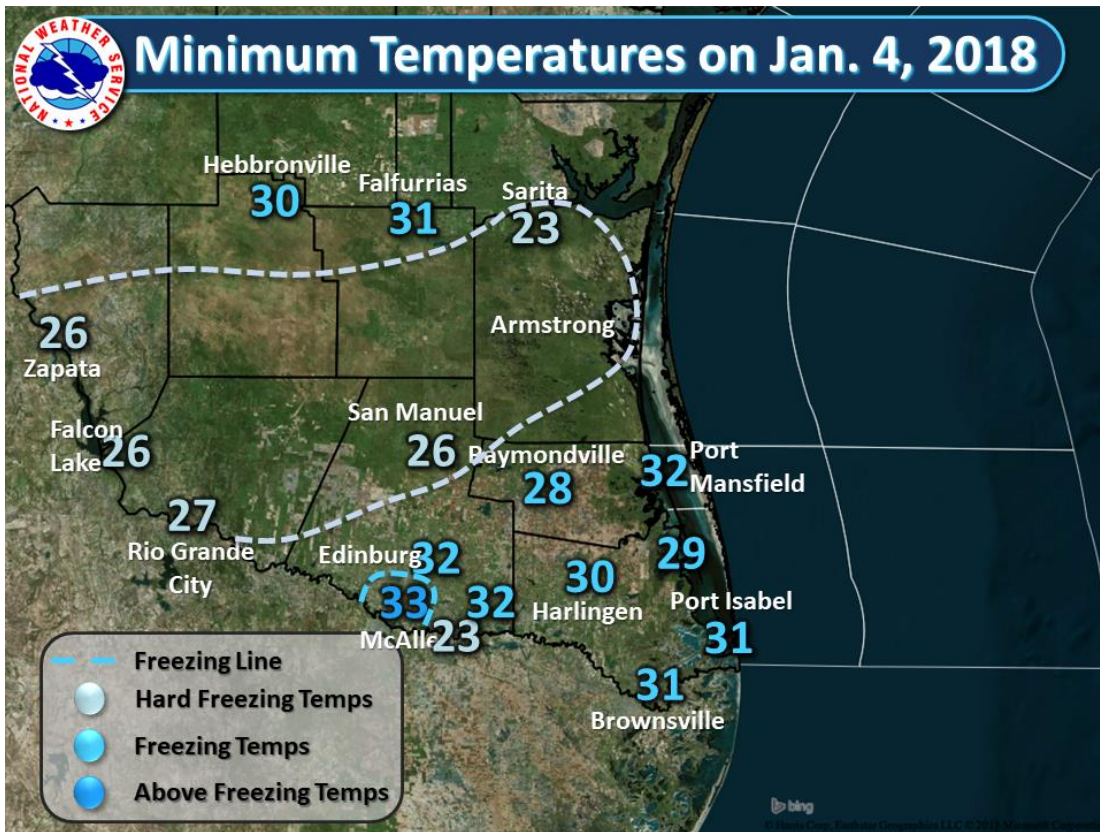


January 1-4 Rio Grande Valley Cold Snap



Figure 1. Frost on rooftops in north Brownsville on January 4, 2018.



The Lion of Winter Roars in to Open 2018
Sub-Freezing Wind Chills and Morning Temperatures Greet RGV New Year

Quick Summary

A nine day period of gray and cool to cold weather that began on Christmas Day 2017 culminated with a modified polar air mass that descended on the Rio Grande Valley New Year's Eve (evening), and persisted through the early morning of January 4th before temperatures rose well above freezing. While no new cold temperature records were set at long-term Valley observation locations (McAllen, Harlingen, and Brownsville), minimum temperatures fell to or below freezing in portions of the Valley and much of the Deep South Texas Brush Country (ranchlands) at varying times from the 1st through early on the 4th. Wind chill, or "feels like" temperatures, crashed into the 20s early on New Year's Day and were reinforced by repeated northerly wind surges through early morning on January 3rd. The graphics below indicate minimum temperatures and wind chills (where applicable) from New Year's Day through the 4th.

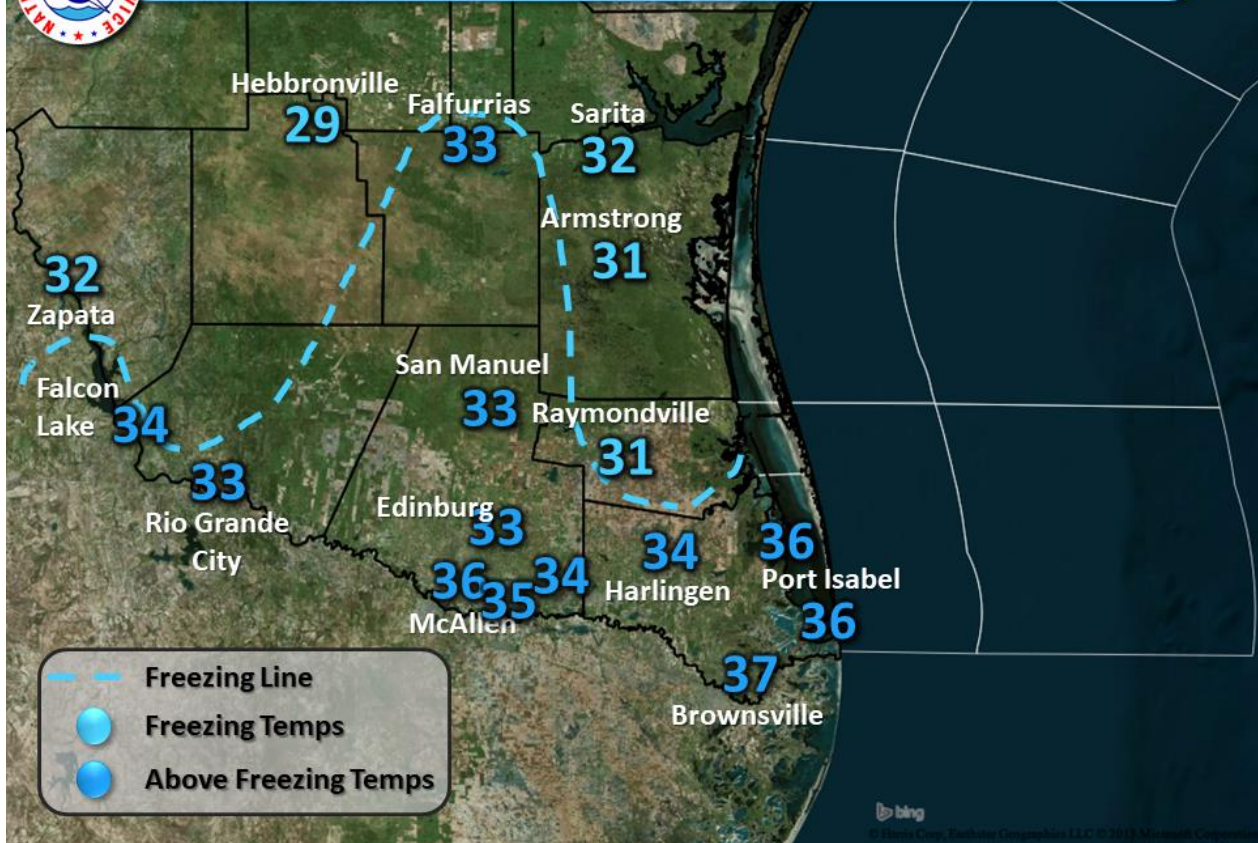
Light precipitation fell at varying times from New Year's Eve until a little after midnight on January 3rd. On New Year's morning, a mix of light sleet and freezing drizzle created a small coating in locations from Zapata through Hebbronville; on January 2nd, a nose of subfreezing temperatures combined with drizzle to reach Harlingen, Weslaco, and Raymondville, with light icing on trees, fences, and a few elevated surfaces. A few other quick statistics for the period:

- Temperatures remained below 40 for most locations for between 36 and 60 hours, beginning during the pre-dawn hours of New Year's Day and continuing through mid-morning January 3rd before sunshine returned and temperatures rebounded into the 50s.
- The northern ranchlands (Hebbronville area) fell to or below freezing at 315 AM on January 1st, and remained at or below freezing for 31 more hours. Temperatures fell back below freezing again early on the 3rd.
- "Feels like" temperatures fell into the upper 20s across the ranchlands, and low 30s to around 40 for most of the Valley, in time for the calendar to change to 2018. Outdoor festivities were much less than usual due to the combination of gusty north wind, light rain/drizzle, and crashing temperatures which reached the mid 30s to mid 40s (actual) in most areas by midnight.
- Nearshore surf/Gulf sea surface temperatures and Laguna Madre temperatures fell below 50 degrees initially during the morning on the 2nd, then for a prolonged period for most of January 3rd and briefly again on the 4th. Lowest temperatures fell to the lower 40s (44°F in Laguna Madre Bay). At least 1,000 cold-stunned Sea Turtles were rescued from the bay and beach during the peak of the cold conditions.
- For the four day period, area average temperatures were nearly 20°F below normal, though warmer weather arrived the following weekend and began reducing the departures.

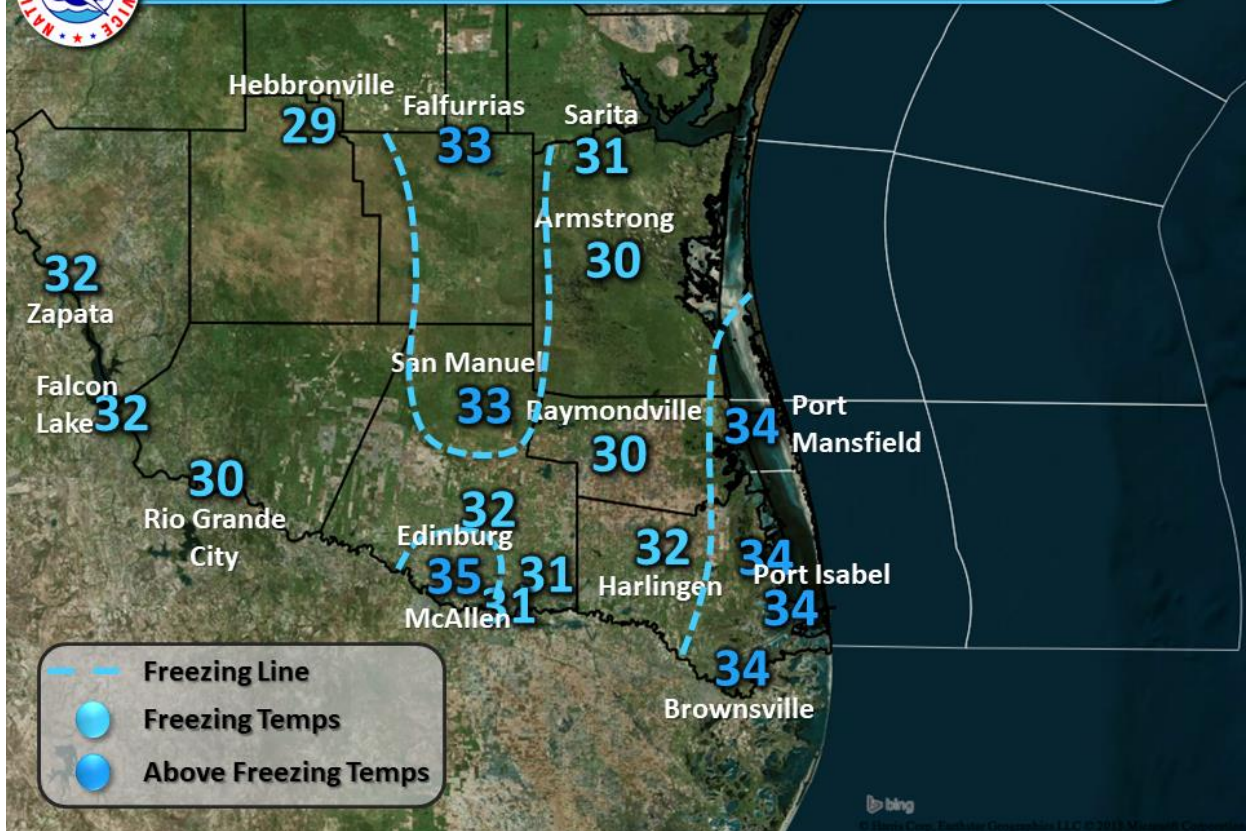
The following pages show minimum temperatures and lowest wind chill ("feels like") temperatures for January 1 to 3, 2018.



Minimum Temperatures on Jan. 1, 2018

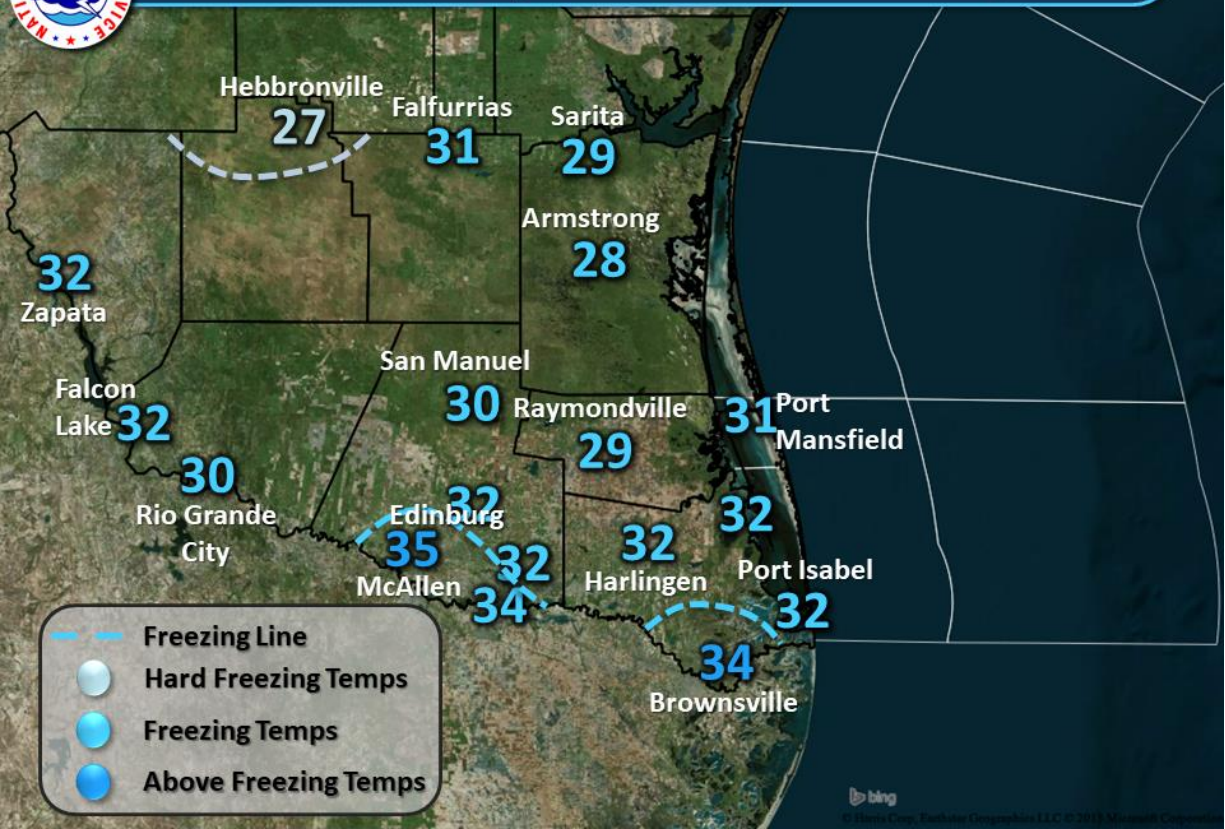


Minimum Temperatures on Jan. 2, 2018

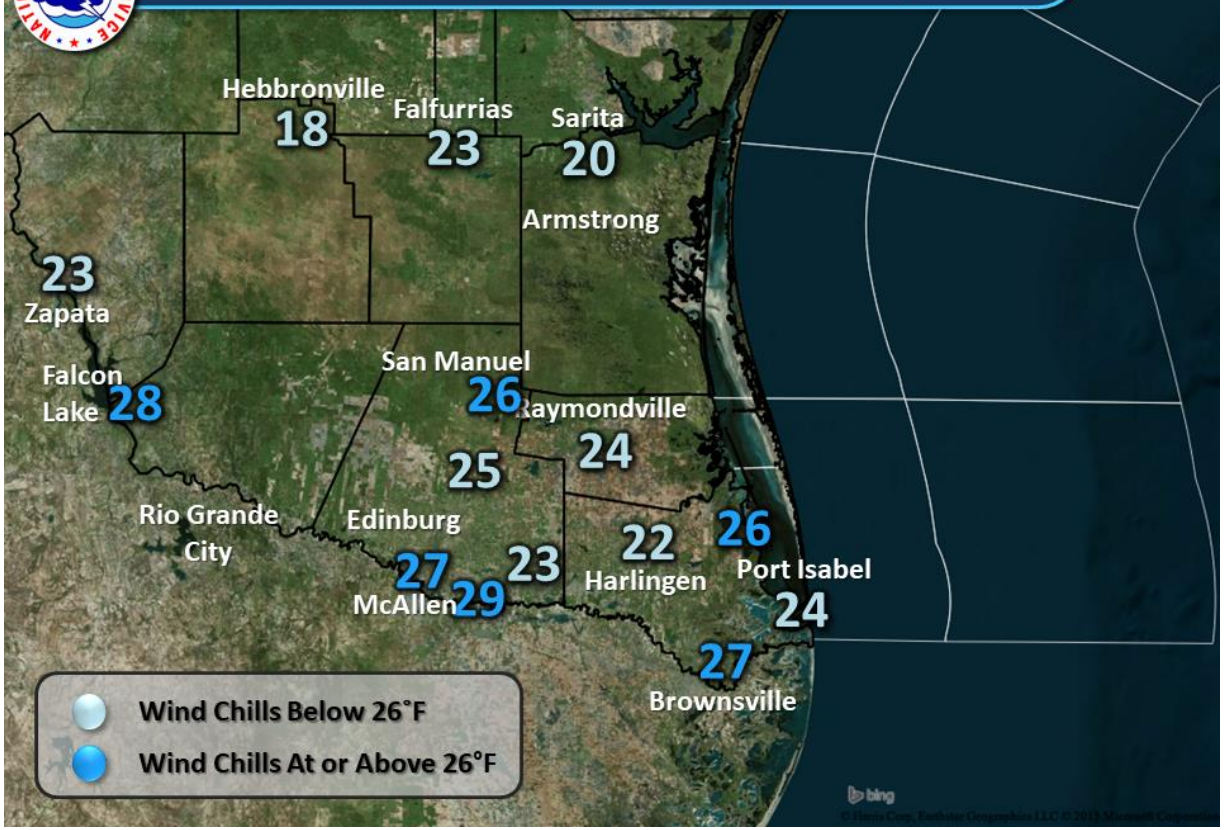




Minimum Temperatures on Jan. 3, 2018

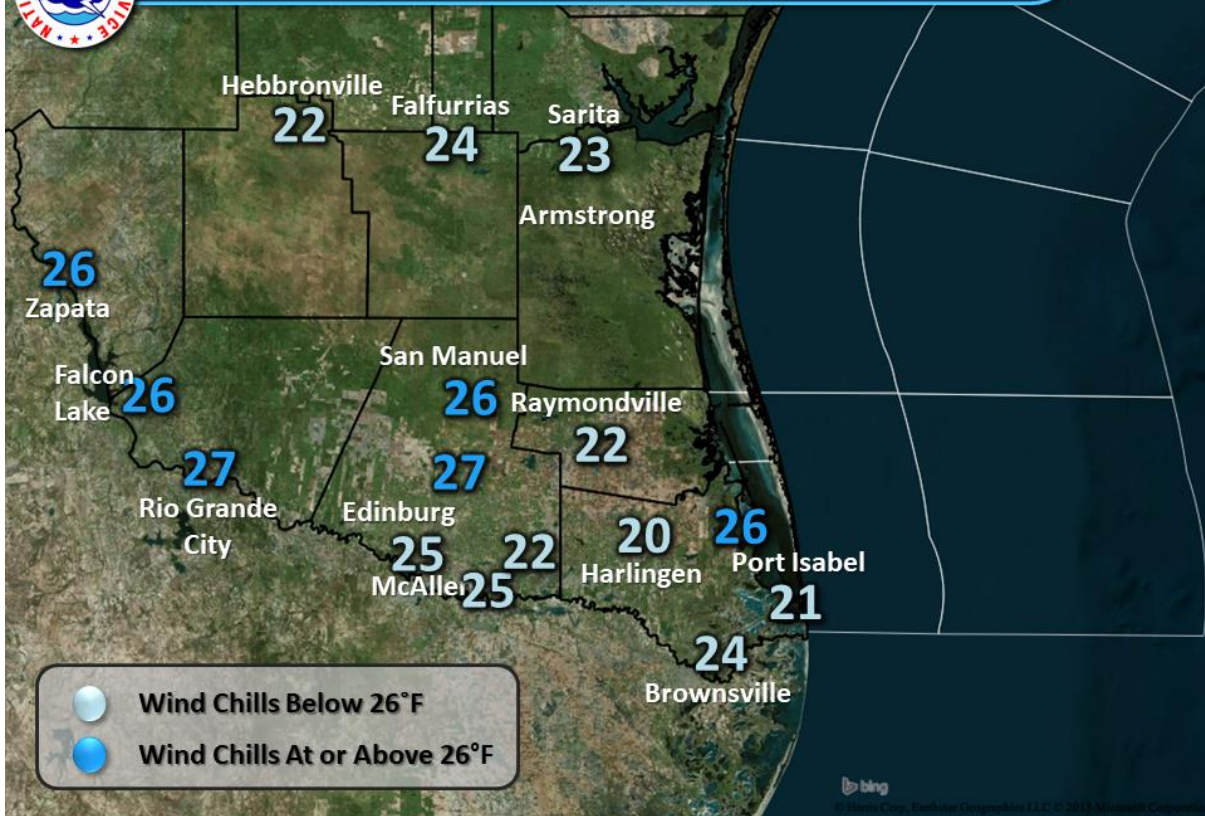


Minimum Wind Chill on Jan. 1, 2018

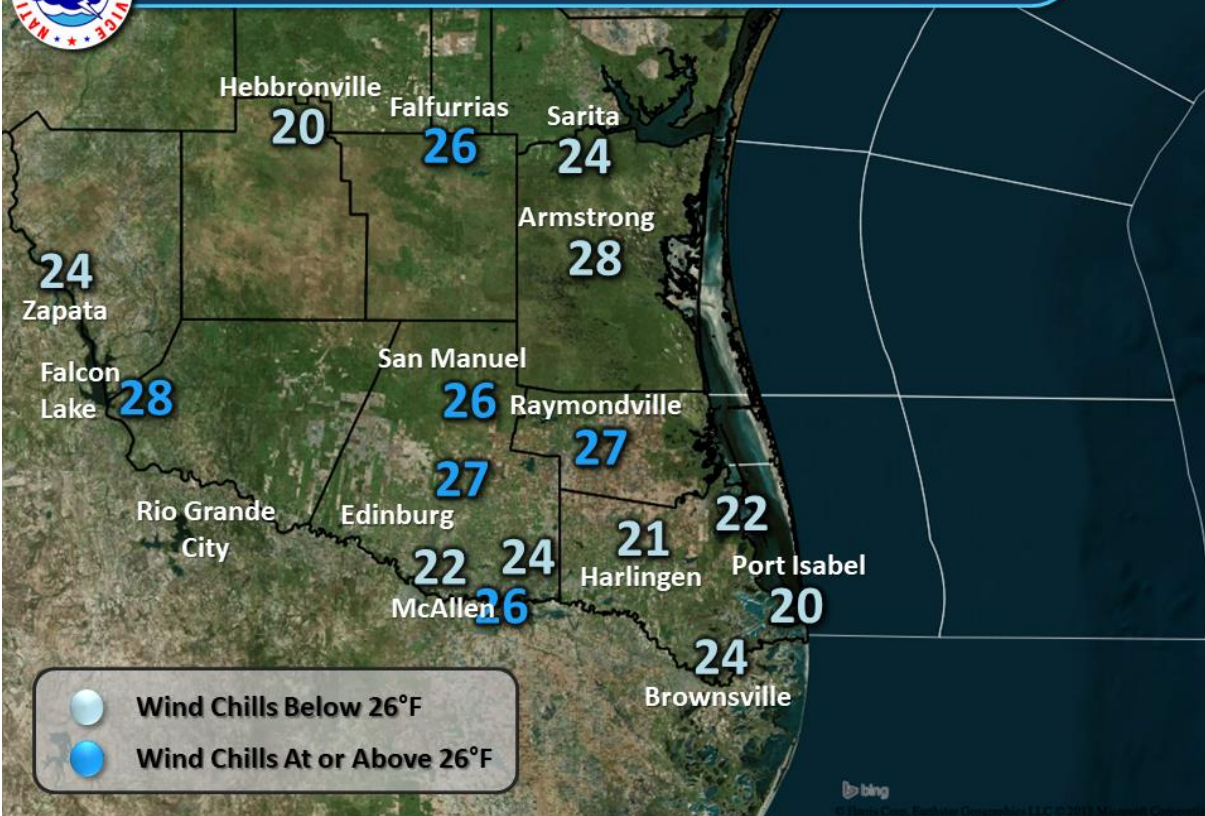




Minimum Wind Chill on Jan. 2, 2018



Minimum Wind Chill on Jan. 3, 2018

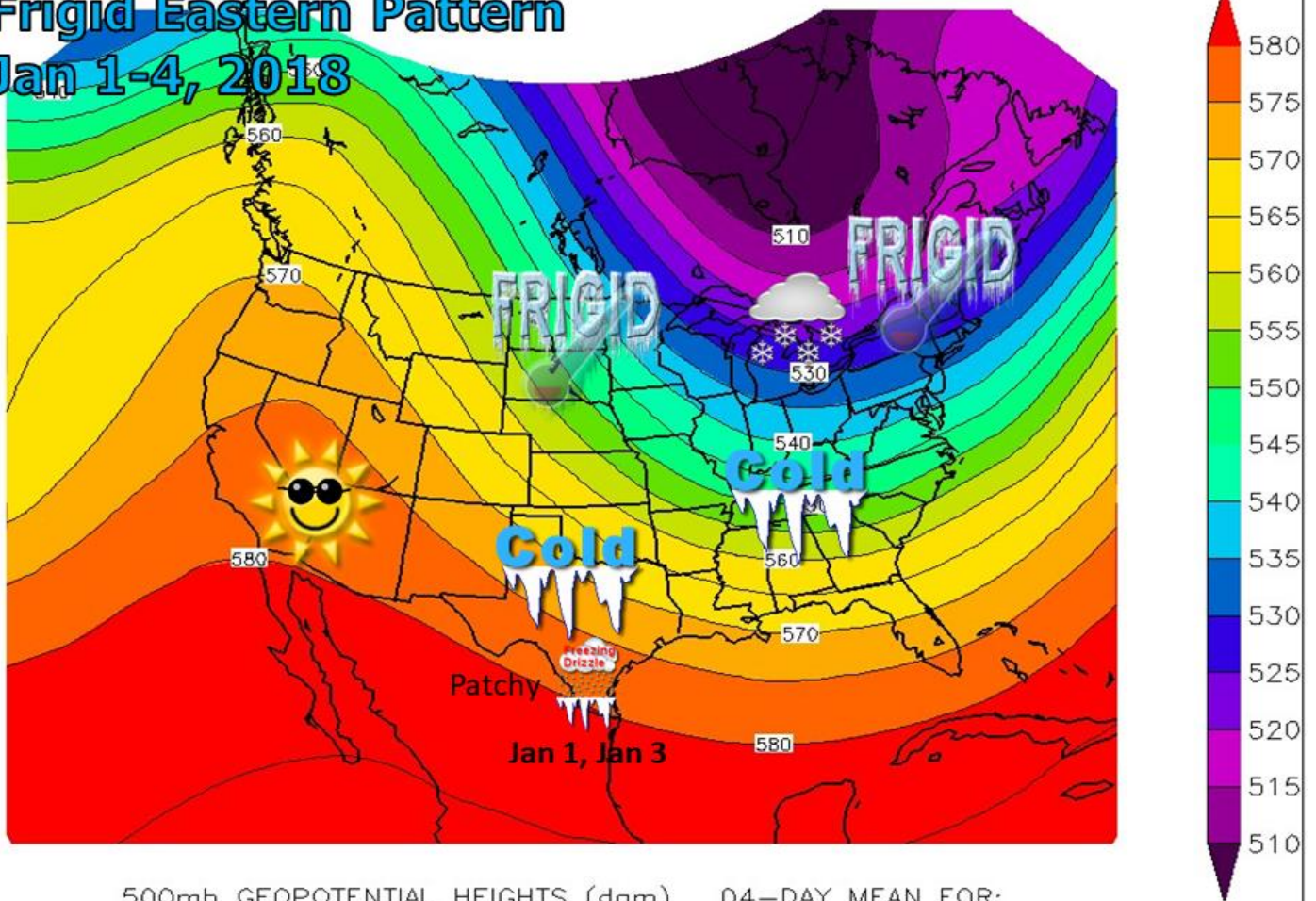


Pattern Matters

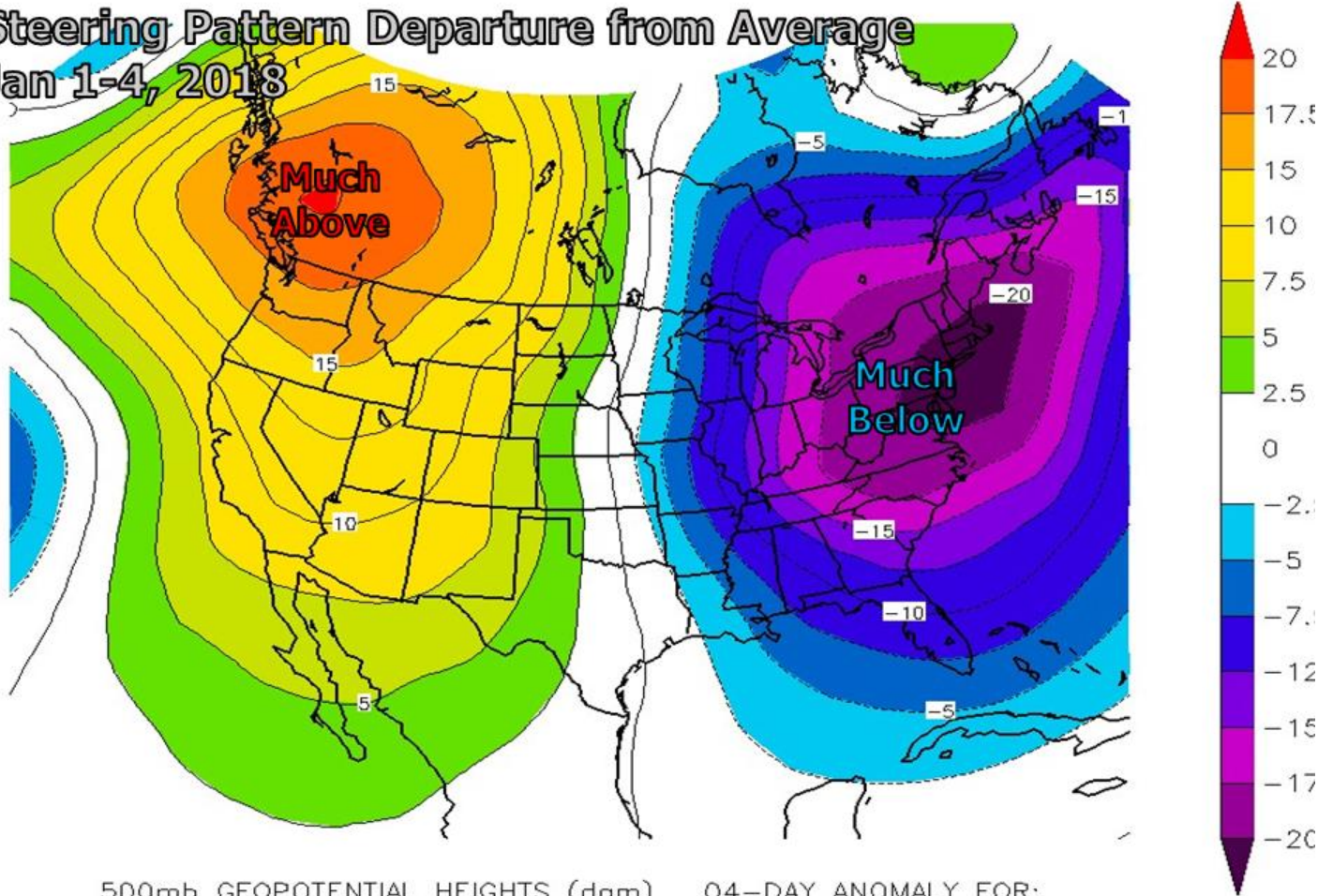
As mentioned for the seasonal (winter) outlook, we expected a warm and dry winter (December-February) with a few “cold snaps”. That “few” became more frequent in December (five in total) and led the month to the first below average case in McAllen, breaking a 32 month streak of average to above average temperatures. Brownsville, however, ended just above average in December, an indication of the roller coaster that started warm to hot, was followed with snow, then followed again by warm to hot condition before the Christmas Day chill down led into the New Year’s Freeze.

A “classic” pattern that opens the door to polar air wide set up in late December, and the full bore of one of the strongest surface high pressure systems in recent years came south. As is typical in such a pattern where the eastern two thirds of the US sees below average “steering” pattern levels, the surface high “split” into two cells, one reaching the eastern U.S. and another nosing south well into northeast Mexico along/east of the Sierra Madre. That surface high was driven by the upper level steering pattern (first slide, below) which originated near the north pole and pushed the cold air south and eastward. At the end of the period, an embedded system developed rapidly along the U.S. east coast, creating a full-bore coastal blizzard from Norfolk, VA to Norfolk, MA.

Frigid Eastern Pattern Jan 1-4, 2018



Steering Pattern Departure from Average Jan 1-4, 2018



500mb GEOPOTENTIAL HEIGHTS (dam) 04-DAY ANOMALY FOR:
Mon JAN 01 2018 - Thu JAN 04 2018
NCEP OPERATIONAL DATASET

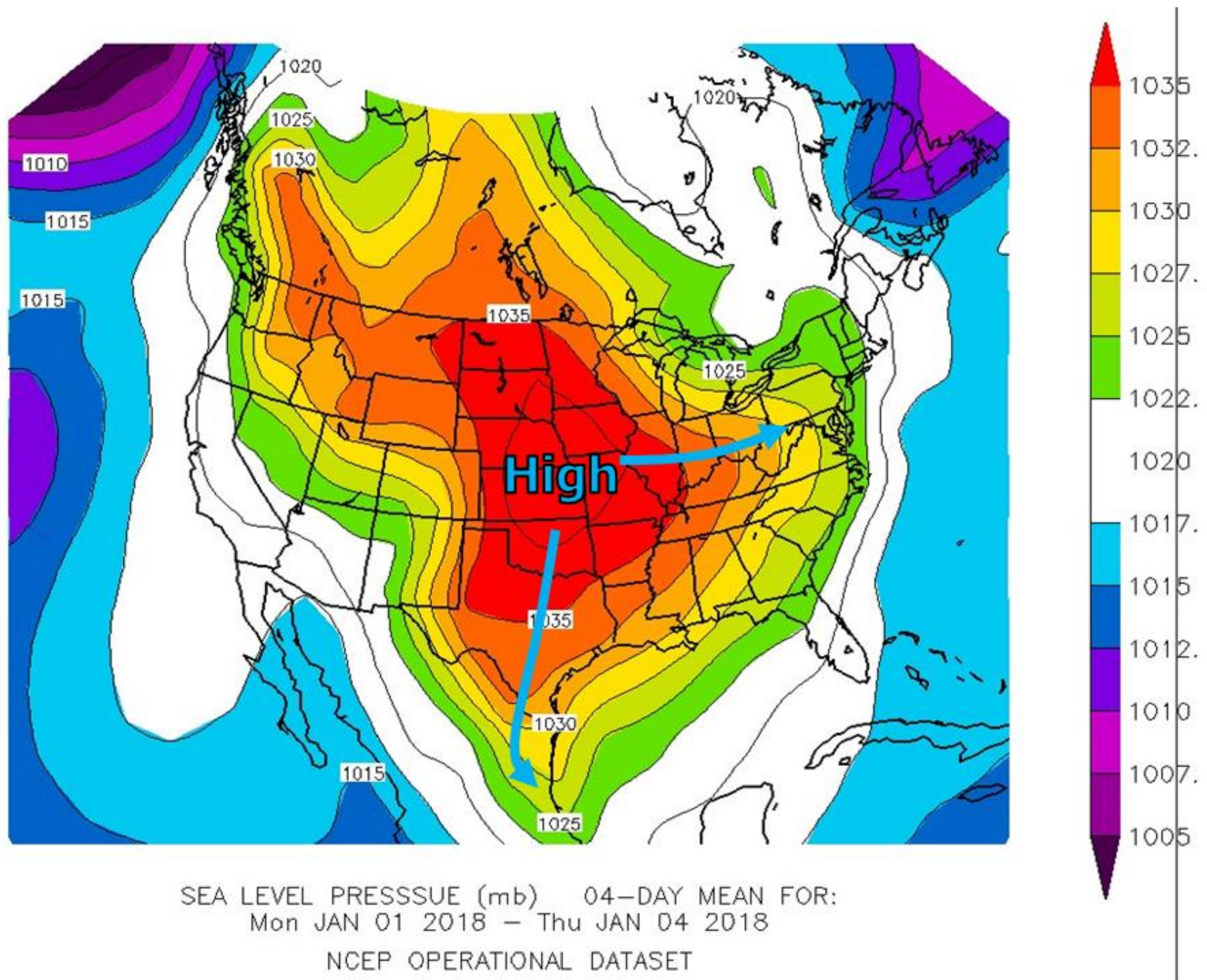
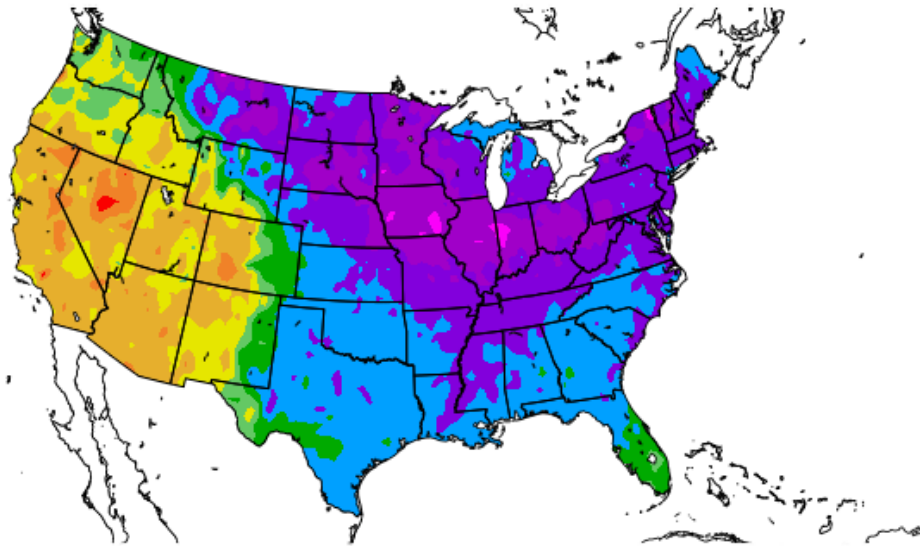


Figure 2. Note the eastward spreading of the surface high from the central US into the eastern US and also the southern Plains. This is typical of the steering pattern (above) and leads to much below average temperatures from Texas to the eastern U.S. – between 10 and 25 degrees in most cases.

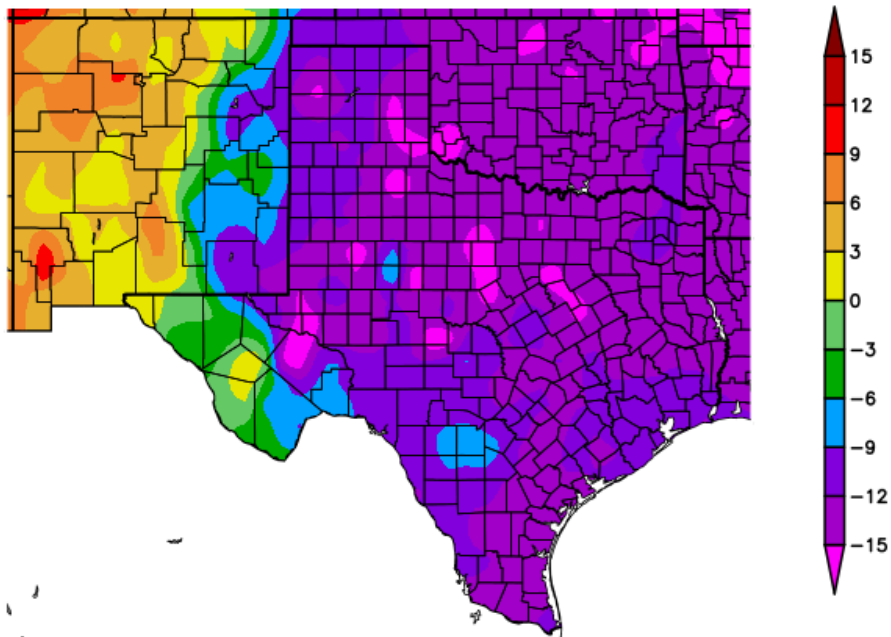
Departure from Normal Temperature (F) 12/30/2017 – 1/5/2018



Generated 1/6/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Temperature (F) 12/30/2017 – 1/5/2018



Generated 1/6/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers