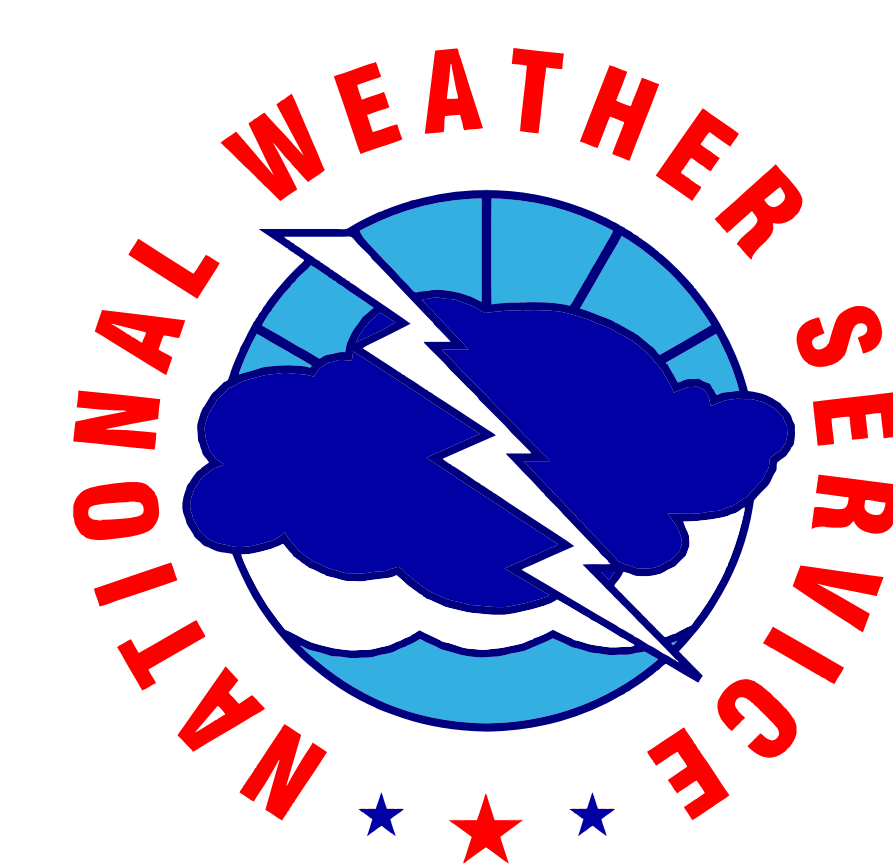


Anatomy of a Rare South Texas Snowstorm: 7–8 December 2017

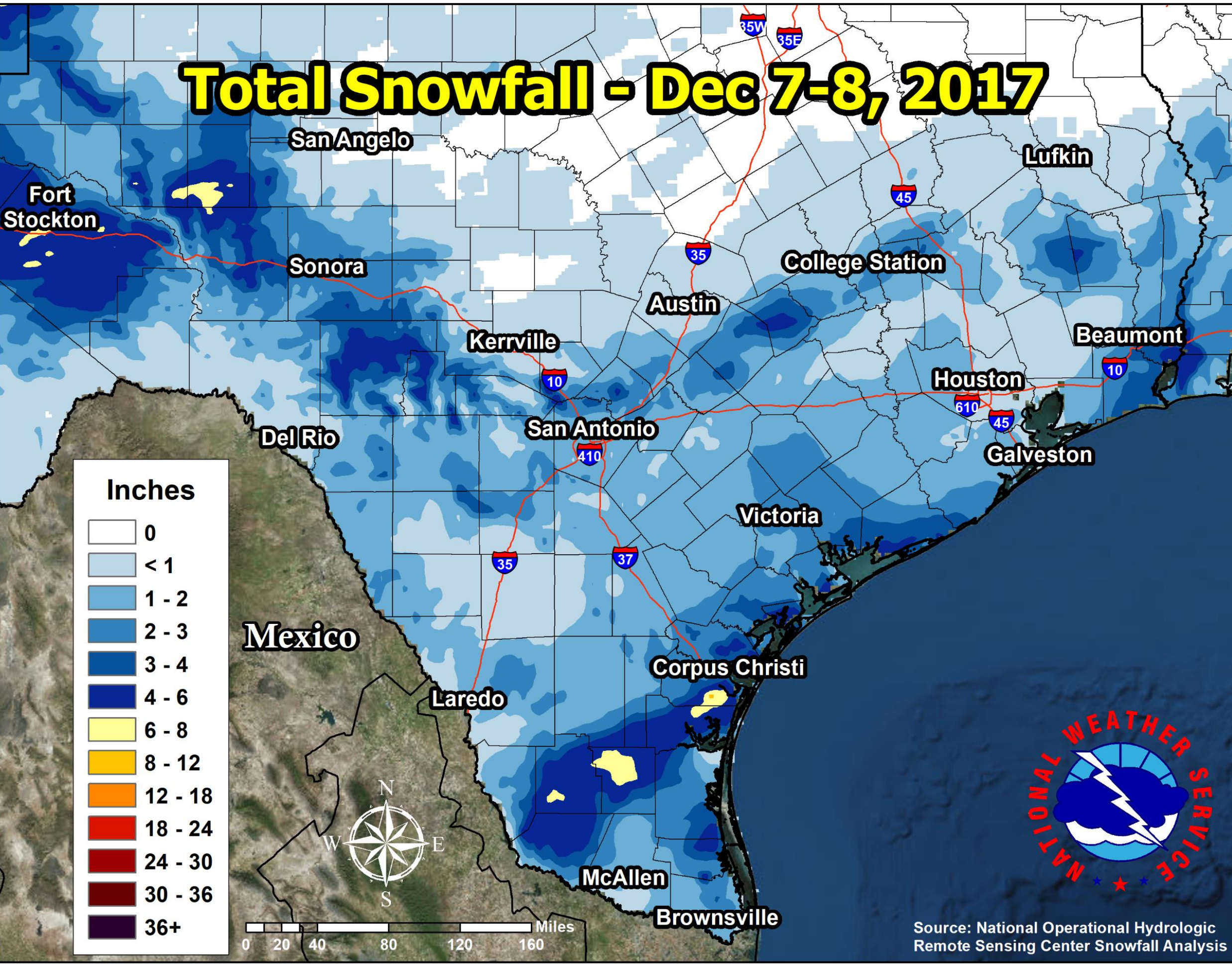
Michael E. Buchanan, NOAA/National Weather Service Corpus Christi, Texas



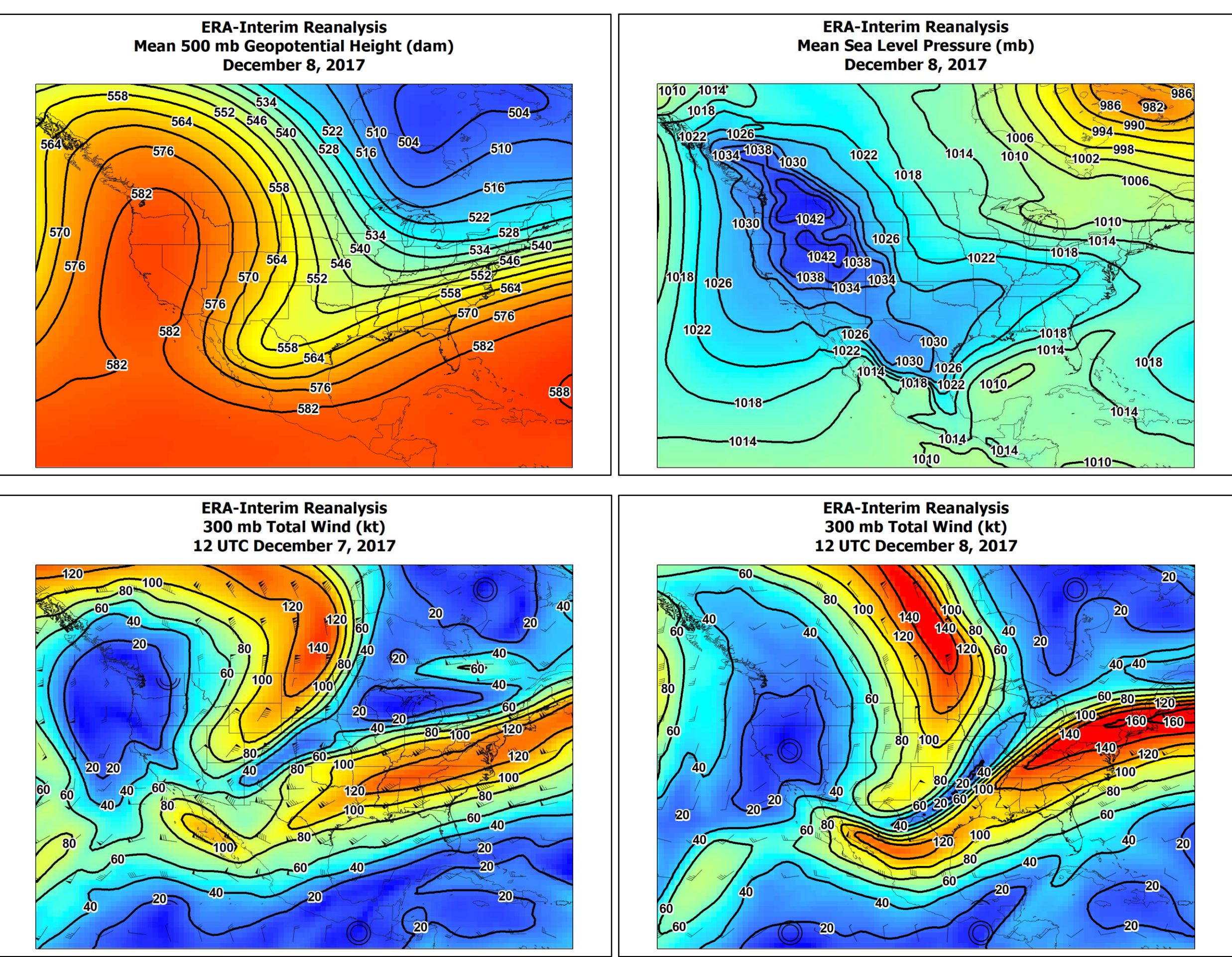
Introduction

On the morning of 7 Dec 2017, rain began changing to snow across the northwest Brush Country of South Texas. Light snow accumulations up to 1.5" fell through the early afternoon. This was in association with an approaching shortwave trough and the right entrance region of an upper level jet streak. A second more intense snowfall, in the form of two bands, began developing between 02 and 04 UTC 8 Dec across northern portions of South Texas. By 07 UTC, all areas had changed from rain to snow as the troposphere cooled, especially the lowest 3 km. Synoptic ascent increased through the morning of 8 Dec due to the approaching shortwave and the exit region of another upper level jet streak. Frontogenesis and the presence of conditional symmetric instability was primarily responsible for these bands. Total snowfall amounts up to 7" were reported on the south side of Corpus Christi. Most areas received 1-4" of snow. Similar historic snowstorms that occurred on 24-25 Dec 2004 and on 14 Feb 1895 will be highlighted.

Observed Snowfall

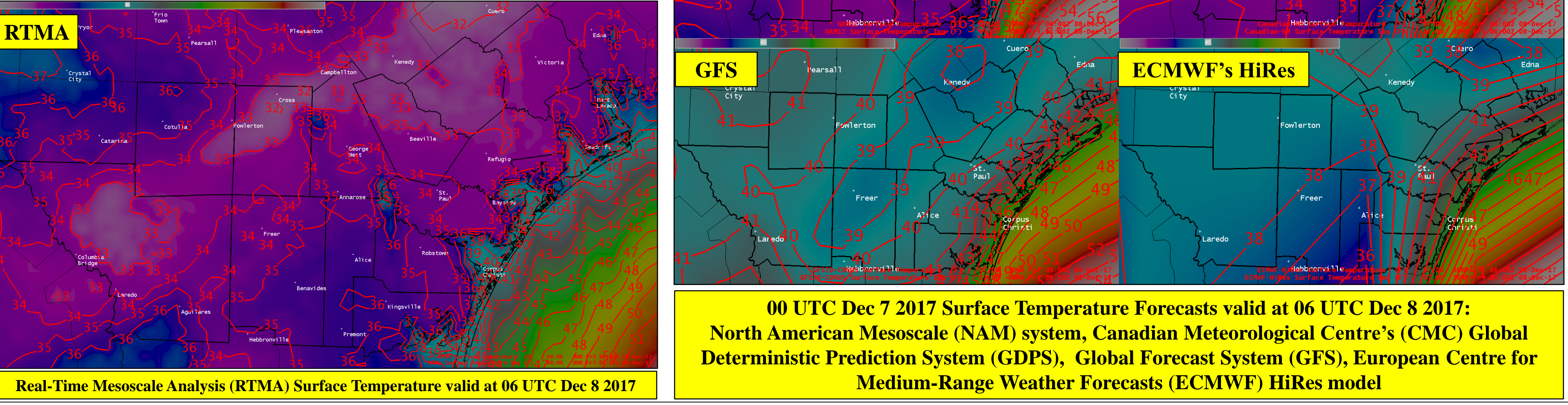


Synoptic Pattern



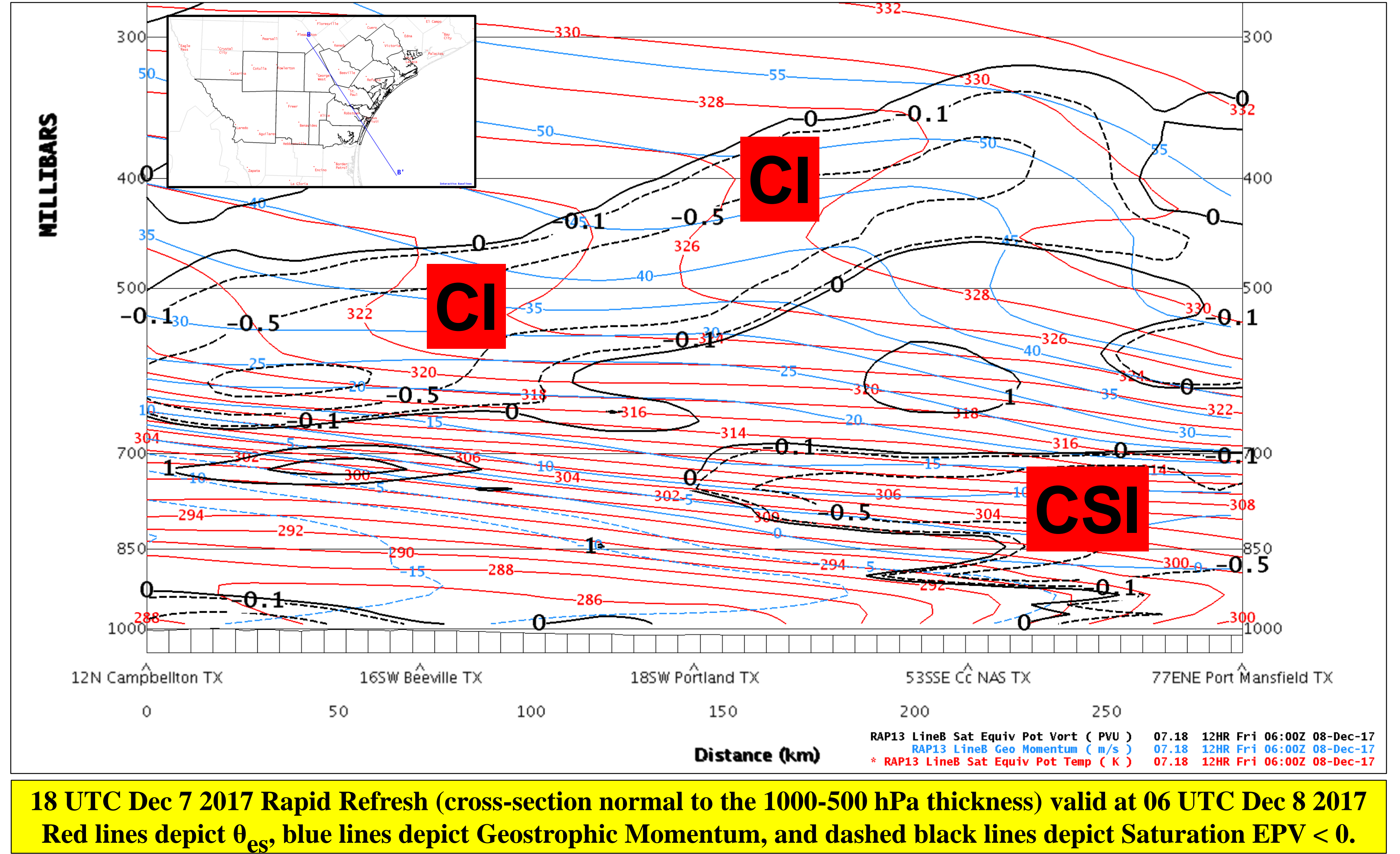
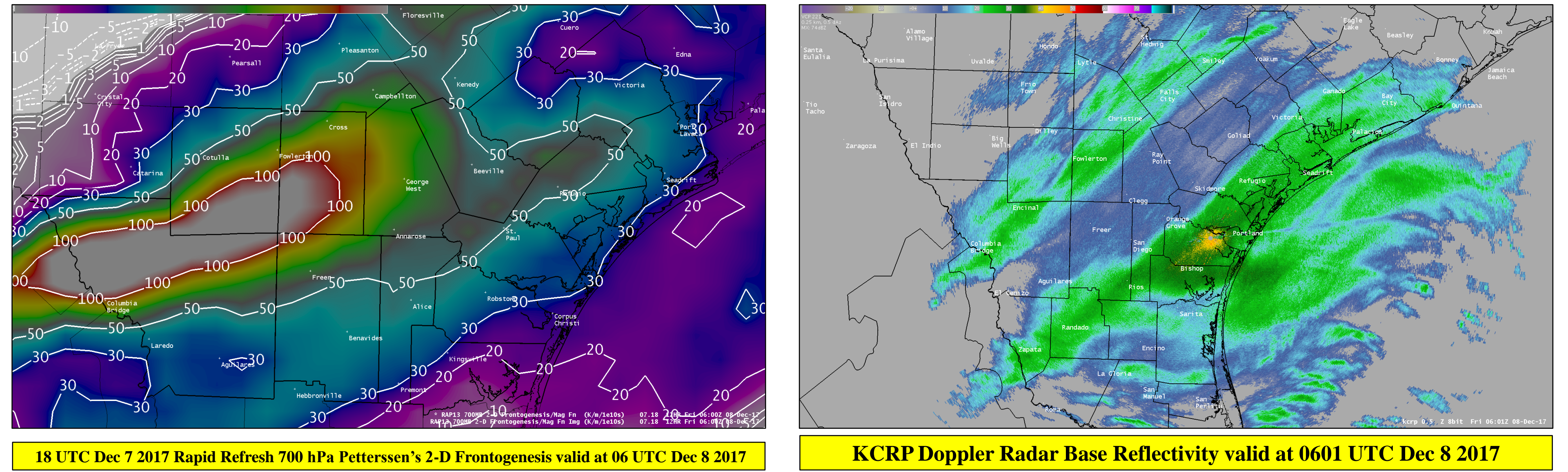
NWP Model Forecasts of Surface Temperatures

The surface temperature forecasts for the NAM and CMC's GDPS consistently depicted the strength of the cold air more accurately than the GFS and ECMWF HiRes models. These latter models were generally too warm in the surface-based layer.

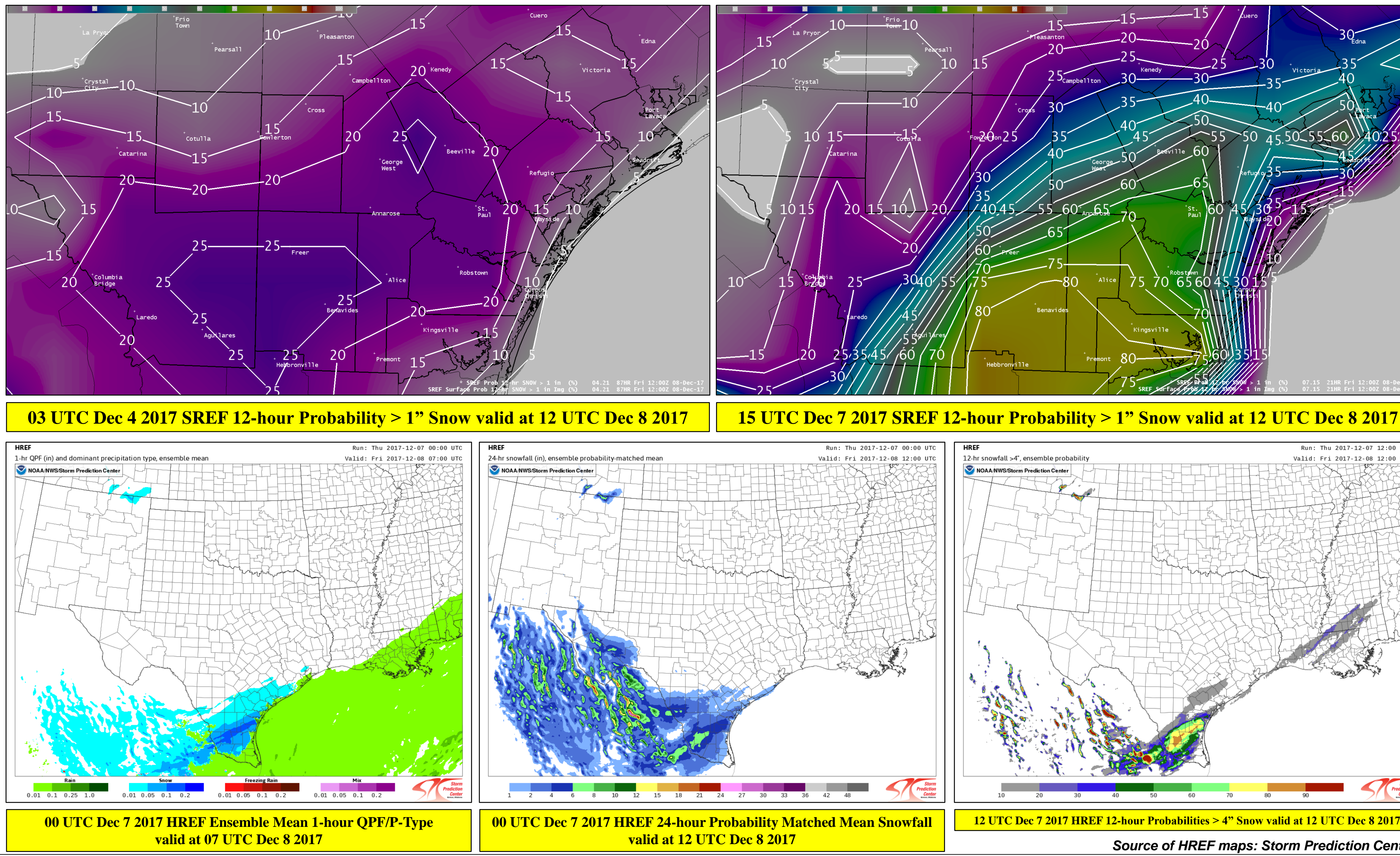


Two Snow Bands: Frontogenesis and Conditional Symmetric Instability

Two snow bands developed during the evening of 7 Dec 2017 and persisted through the morning of the 8th. The primary snow band extended from Zapata to Nueces to Calhoun counties. The secondary snow band extended from Webb county to Choke Canyon Reservoir. The primary snow band weakened and merged with the secondary snow band around 1200 UTC on the 8th. Frontogenesis and Conditional Symmetric Instability (CSI) aided in producing these snow bands.



Probabilistic Snow Forecasts from the Short Range Ensemble Forecast (SREF) and the High Resolution Ensemble Forecast (HREF)



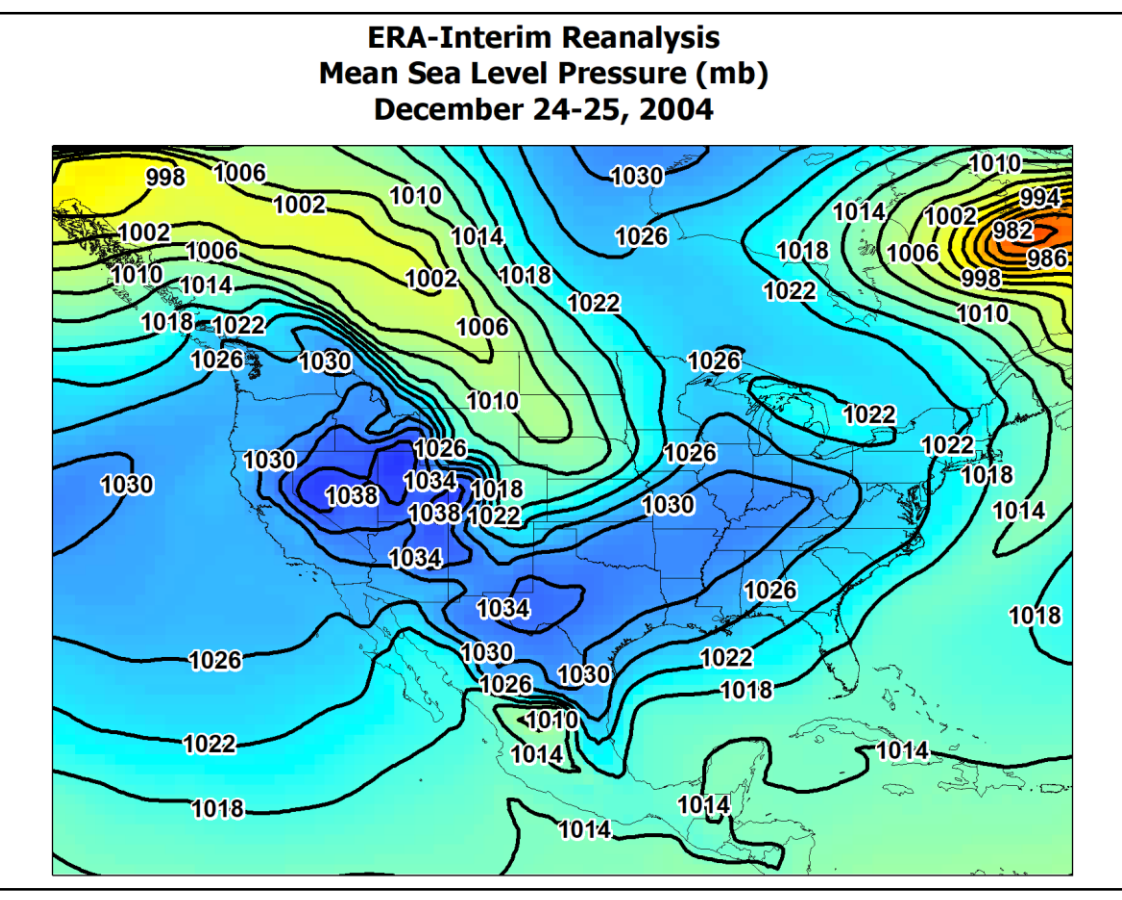
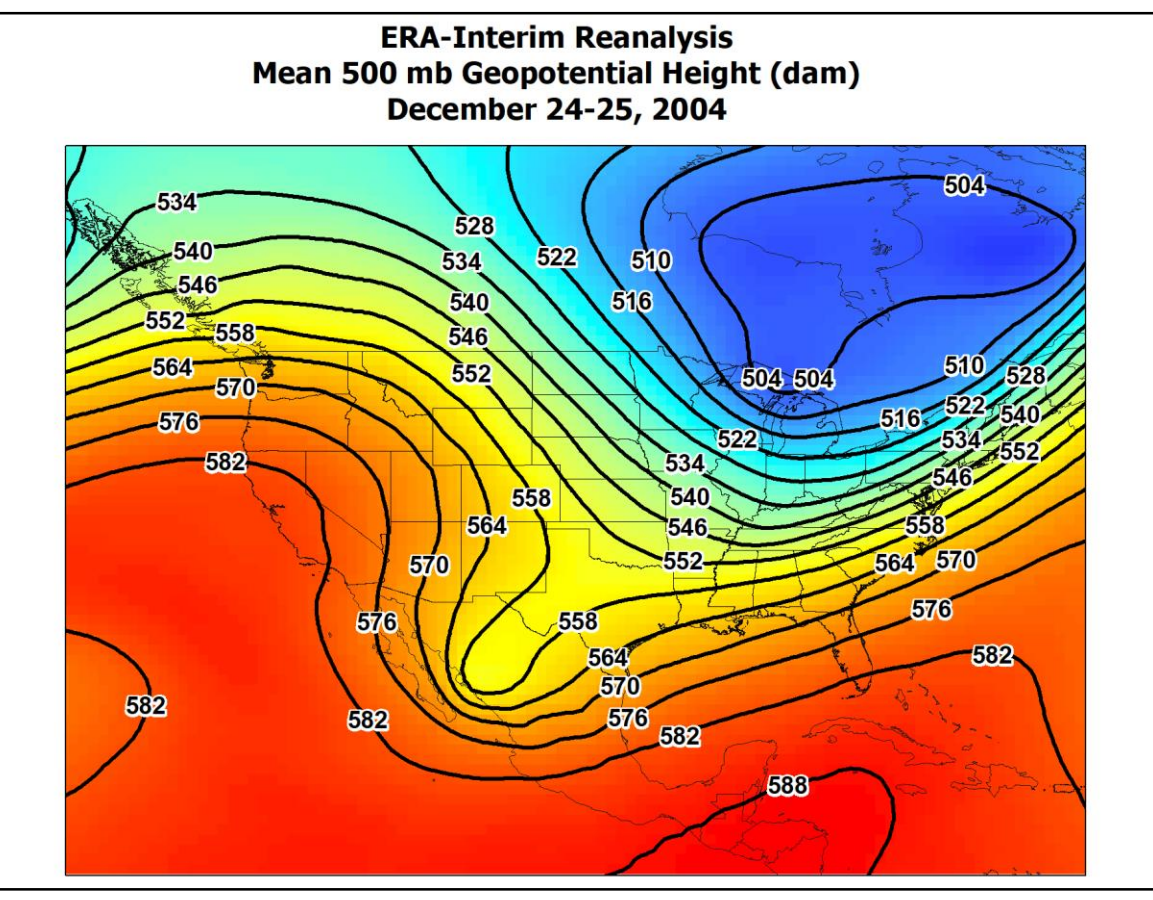
Thundersnow

Lightning, both in-cloud and cloud-to-ground, occurred multiple times within the two snow bands between 0621 and 1008 UTC on 8 Dec 2017 across Jim Hogg, Nueces, Webb, and Zapata counties. Most of the lightning occurred in Nueces county, where the Corpus Christi International Airport (KCRP) is located (See the ASOS observation below from 0848 UTC 8 Dec 2017). Convective Instability (CI) aloft and/or the persistent Conditional Symmetric Instability (CSI) produced the lightning.

SPECI KCRP 080848Z COR 35017KT 1/2SM R13/4500V6000FT TSSN FG SCT005 OVC007 00/00 A3035 RMK AO2 LTG DSNT S TSB23 OCNL LTGIC DSNT S TS DSNT S MOV NE P0002 \$

Past South Texas Snowstorms: 24-25 December 2004, 14 February 1895 (Sources: ERA-Interim, NOAA/CIRES 20th Century Reanalysis Version 2c)

Total Snowfall 2004	Location
12.5"	Victoria
9.5"	Refugio
8"	Alice, Calliham
7"	Sinton, Whitsett
6"	Benavides, George West, Three Rivers
5.3"	Goliad
5.2"	Port Lavaca
5"	Fowlerton, Kingsville, Tilden
4.5"	Encinal
4.4"	Corpus Christi International Airport
4"	Freer
1.1"	Laredo



Total Snowfall 1895	Location
12"	Victoria
7.5"	Beeville
4.5"	Alice, Flour Bluff
4.3"	Corpus Christi
2"	Laredo
20" (2-day total)	Houston
15.4" (2-day total)	Galveston
14"	Cuero
9"	Hallettsville
8"	Devine
6"	Austin, Brownsville

