Overview of a Heavy Rain/Snow Event in the Texas Panhandle

November 11-12, 2010

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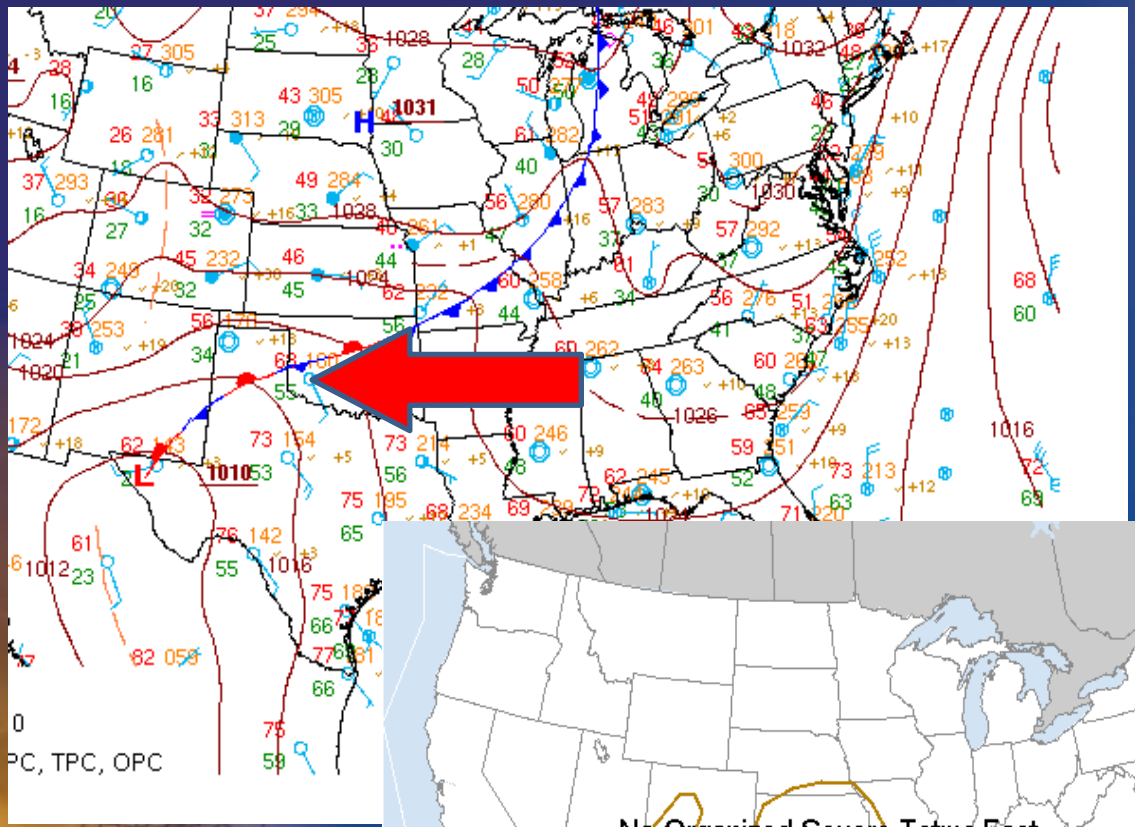
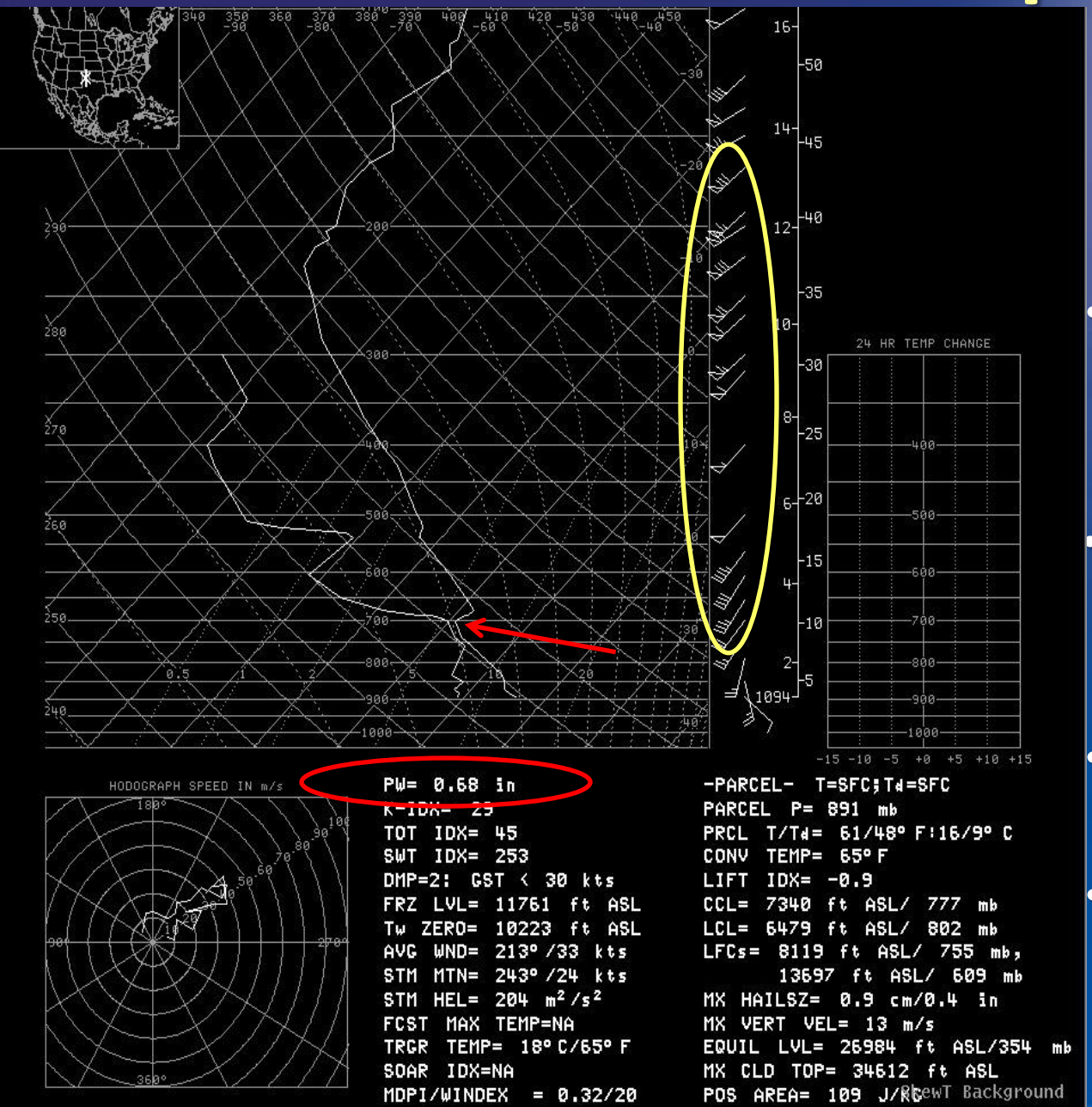
National Weather Service, Amarillo

Event Setup



- Stalled frontal boundary across the southern Texas Panhandle
- Warm and moist air mass south of the front
- Area was out looked in general thunder

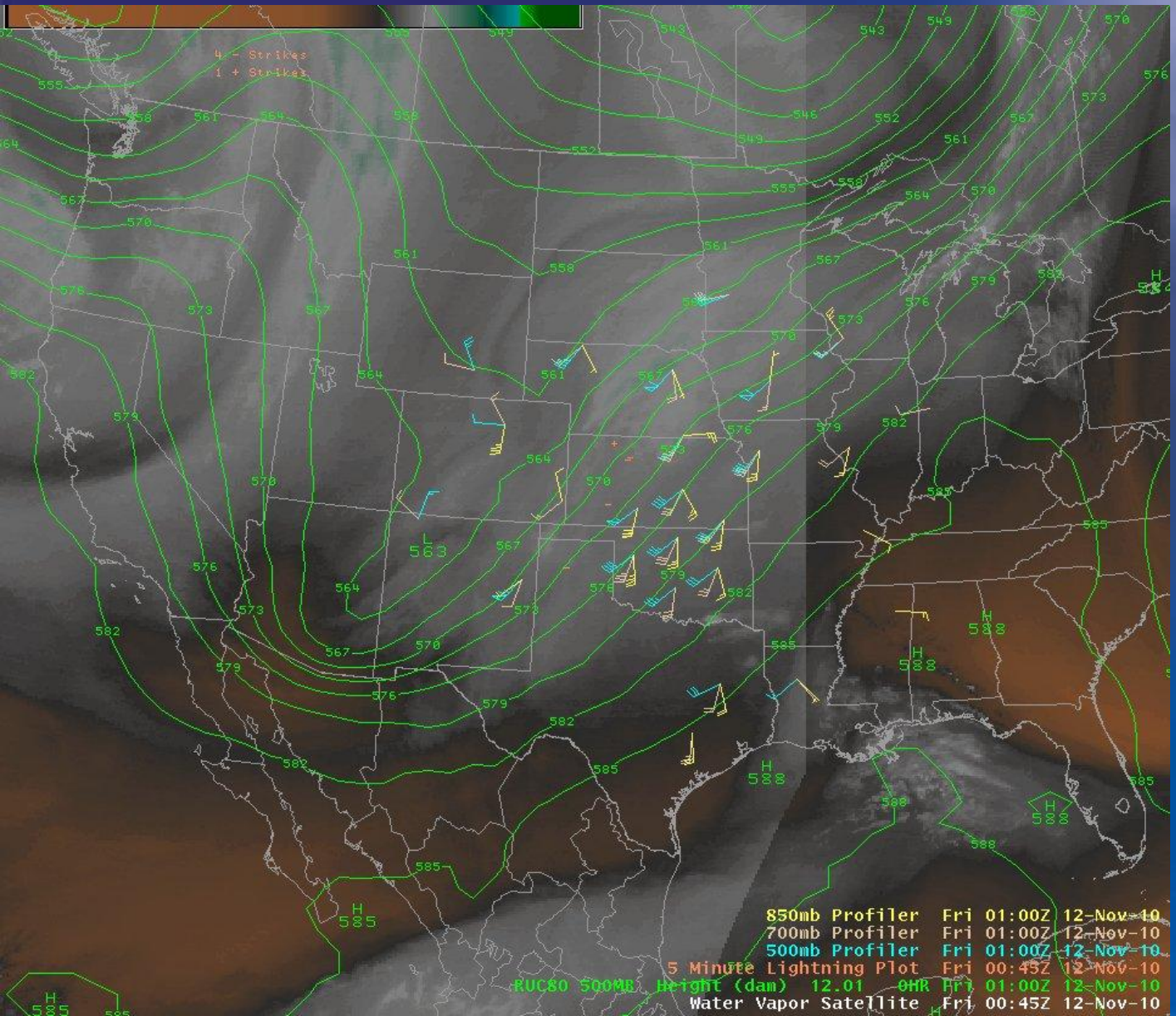
Event Setup



- PWATs of 0.68 inches off the 00 UTC sounding were 200% of normal.
- Mid and upper level flow was parallel to the surface front.
- Mid level cap present
- Elevated instability present

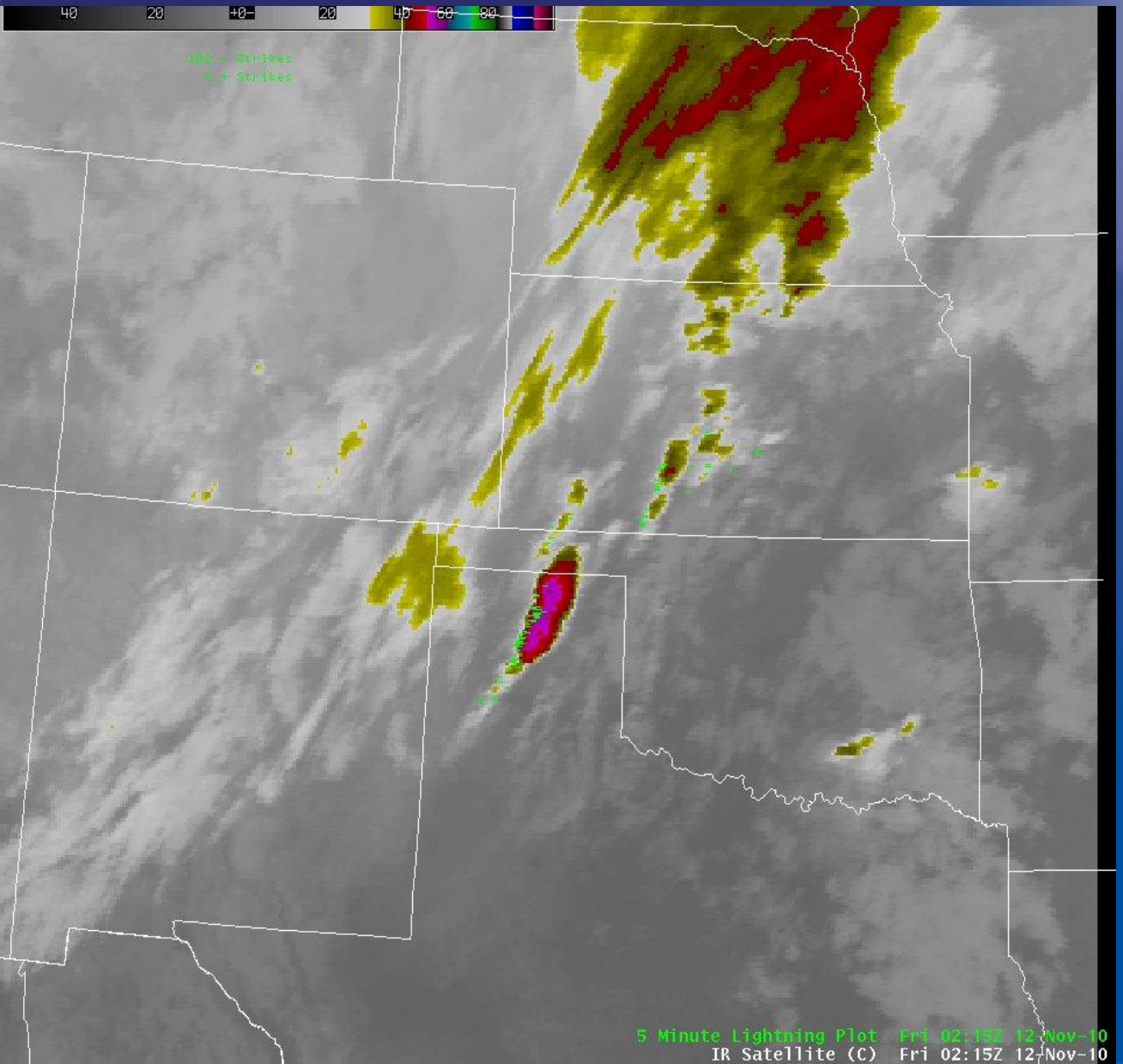
00 UTC 12Nov KAMA Sounding

Event Setup



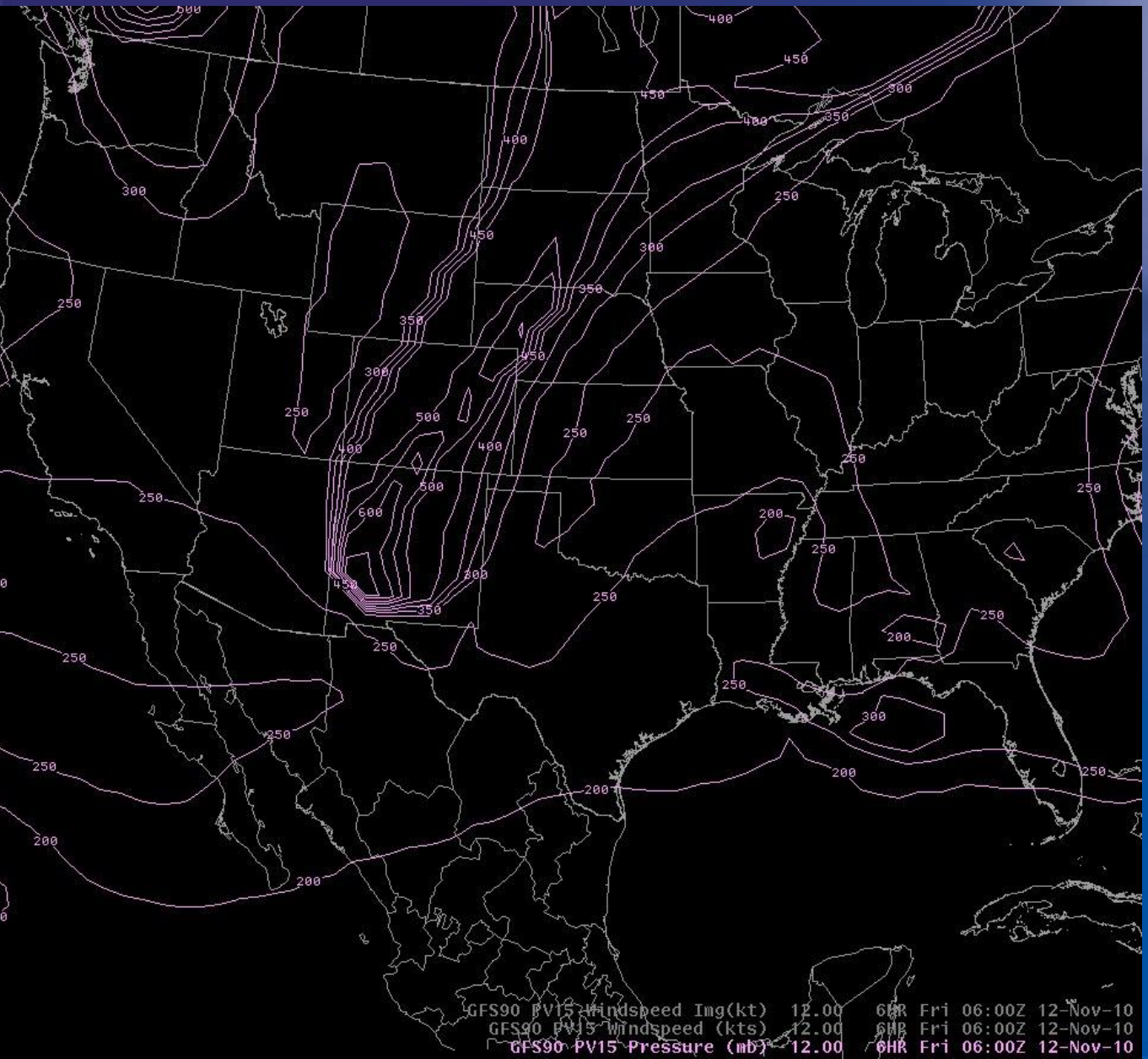
- Abundant mid
- and upper level moisture across the Panhandles
- Lead shortwave trough entering southern NM
- Strong system with cold temperatures aloft

Event Setup



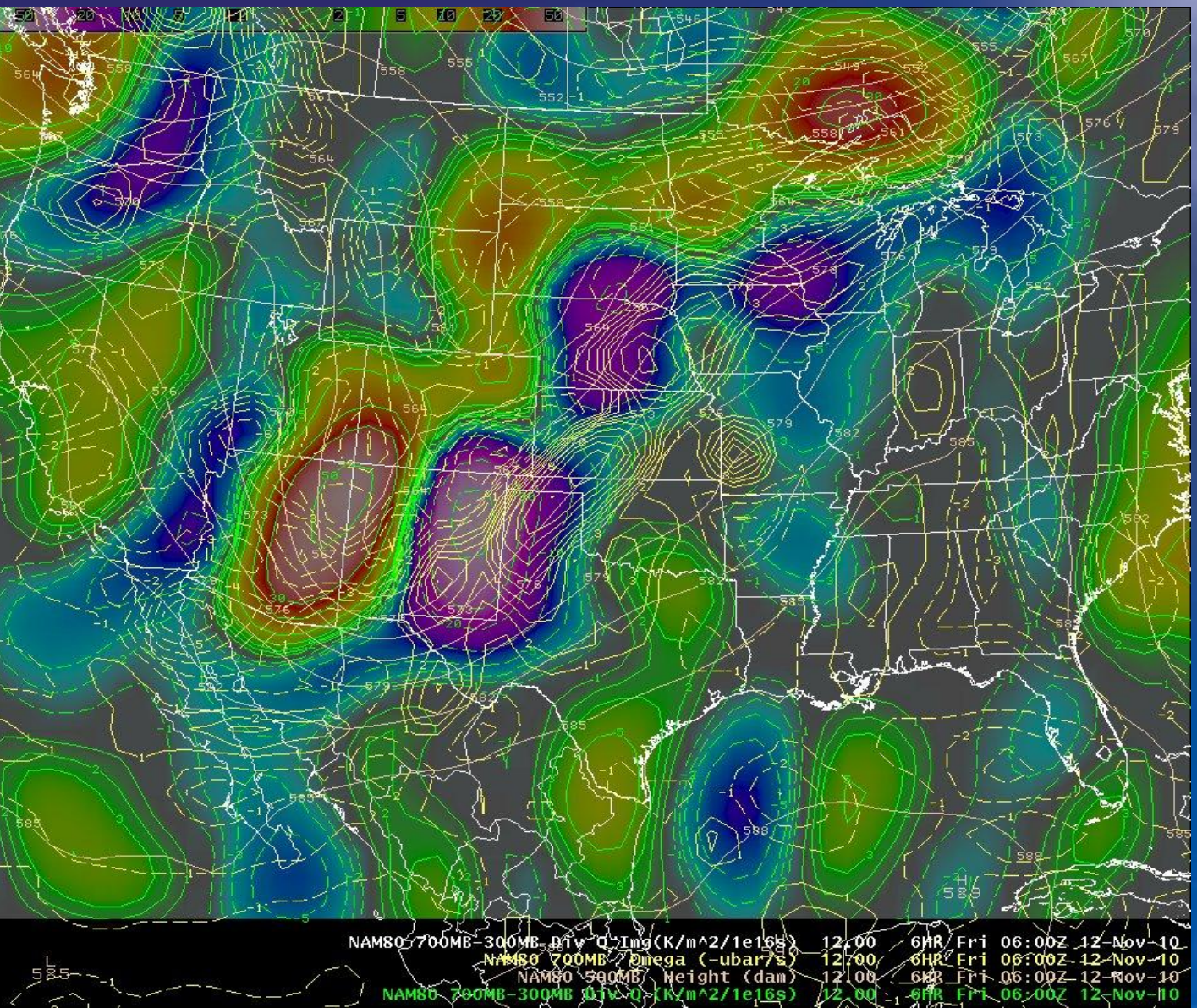
Cooling cloud tops on the IR satellite imagery indicates convection increasing across the central and southern Texas Panhandle

Event Setup



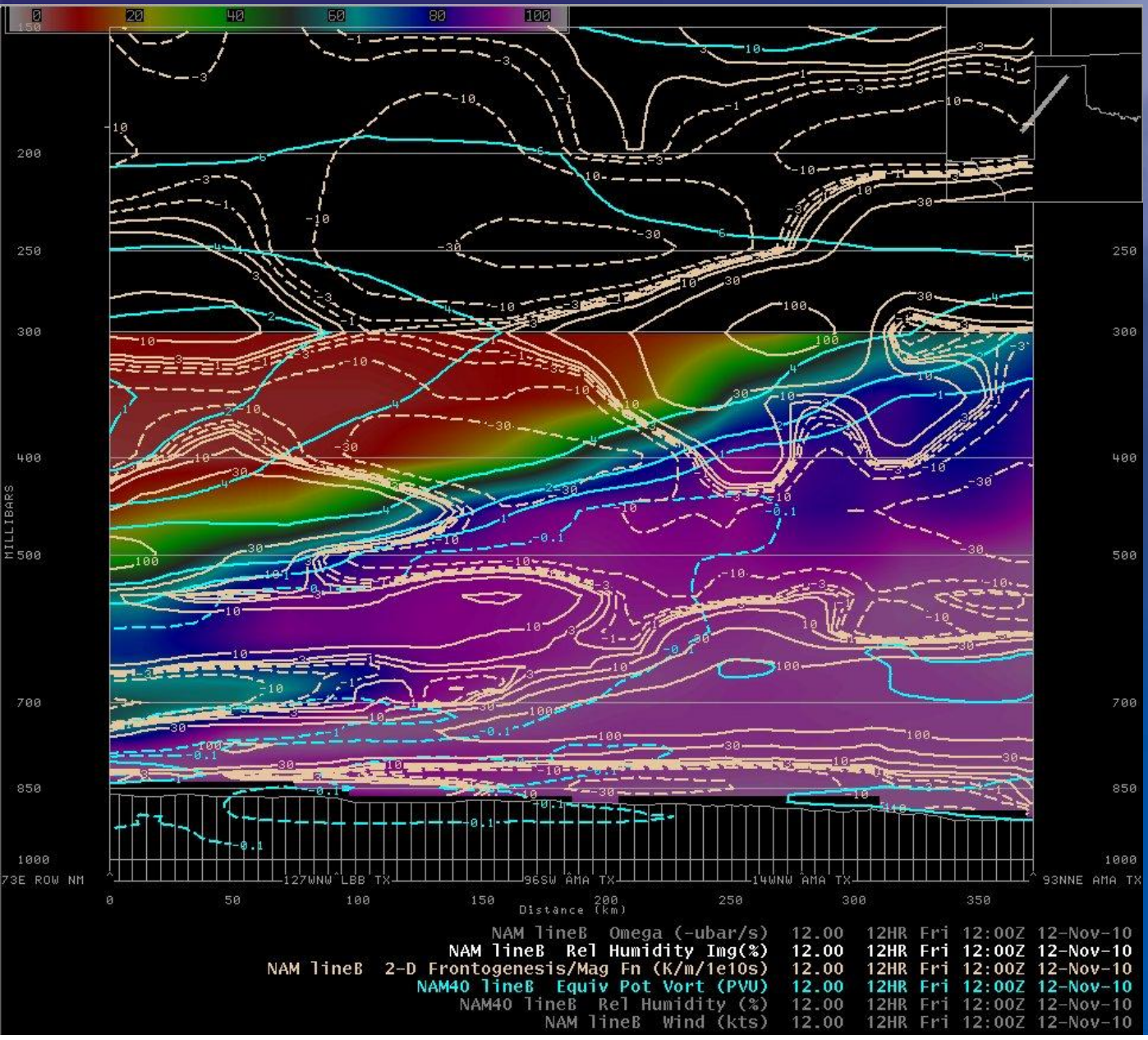
Tropopause pressure (potential vorticity) advection also enhanced convection in the area

Event Setup



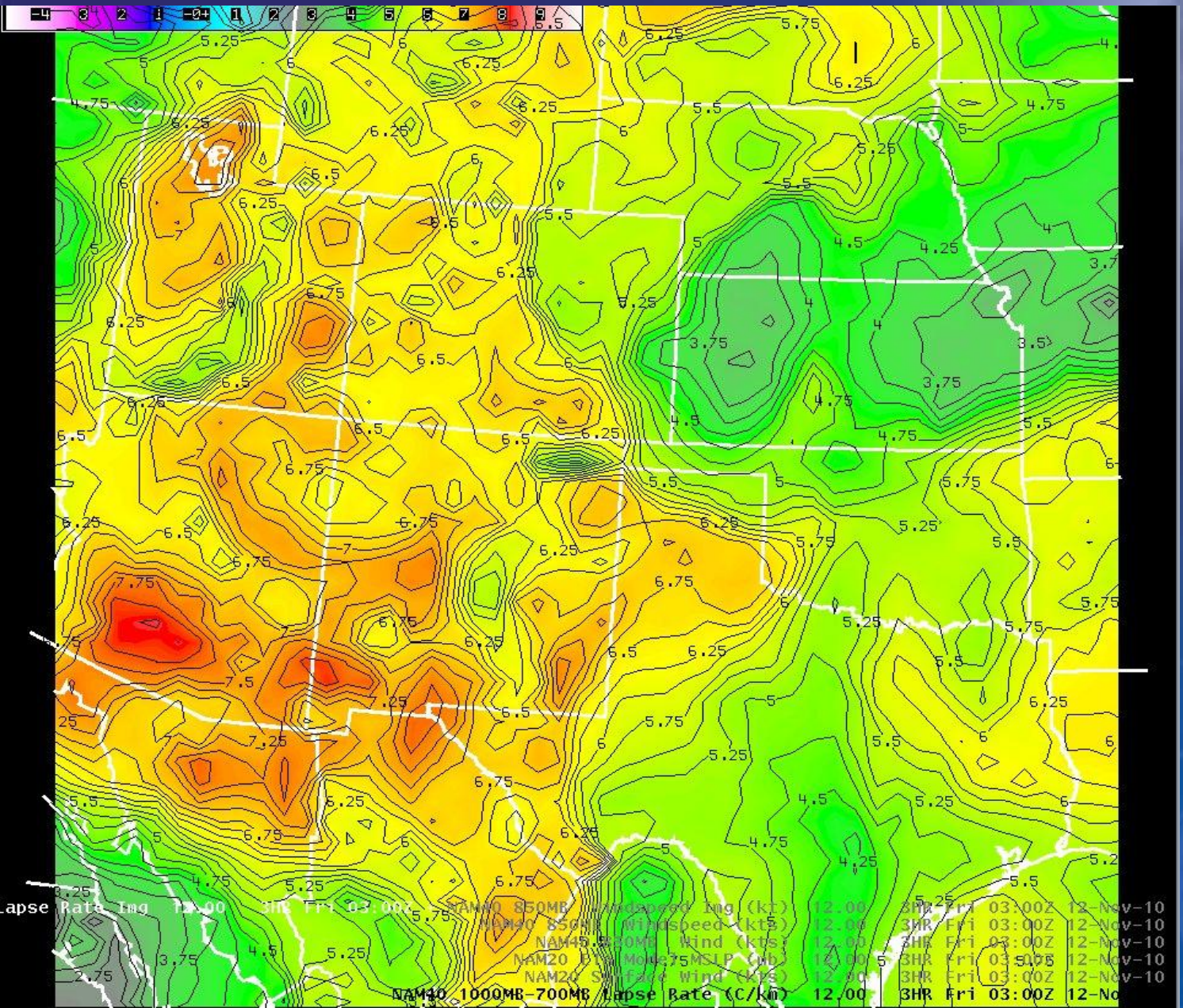
Mid to upper level Q-Vector Convergence worked in tandem with potential vorticity advection to maximize lift across the area

Event Setup



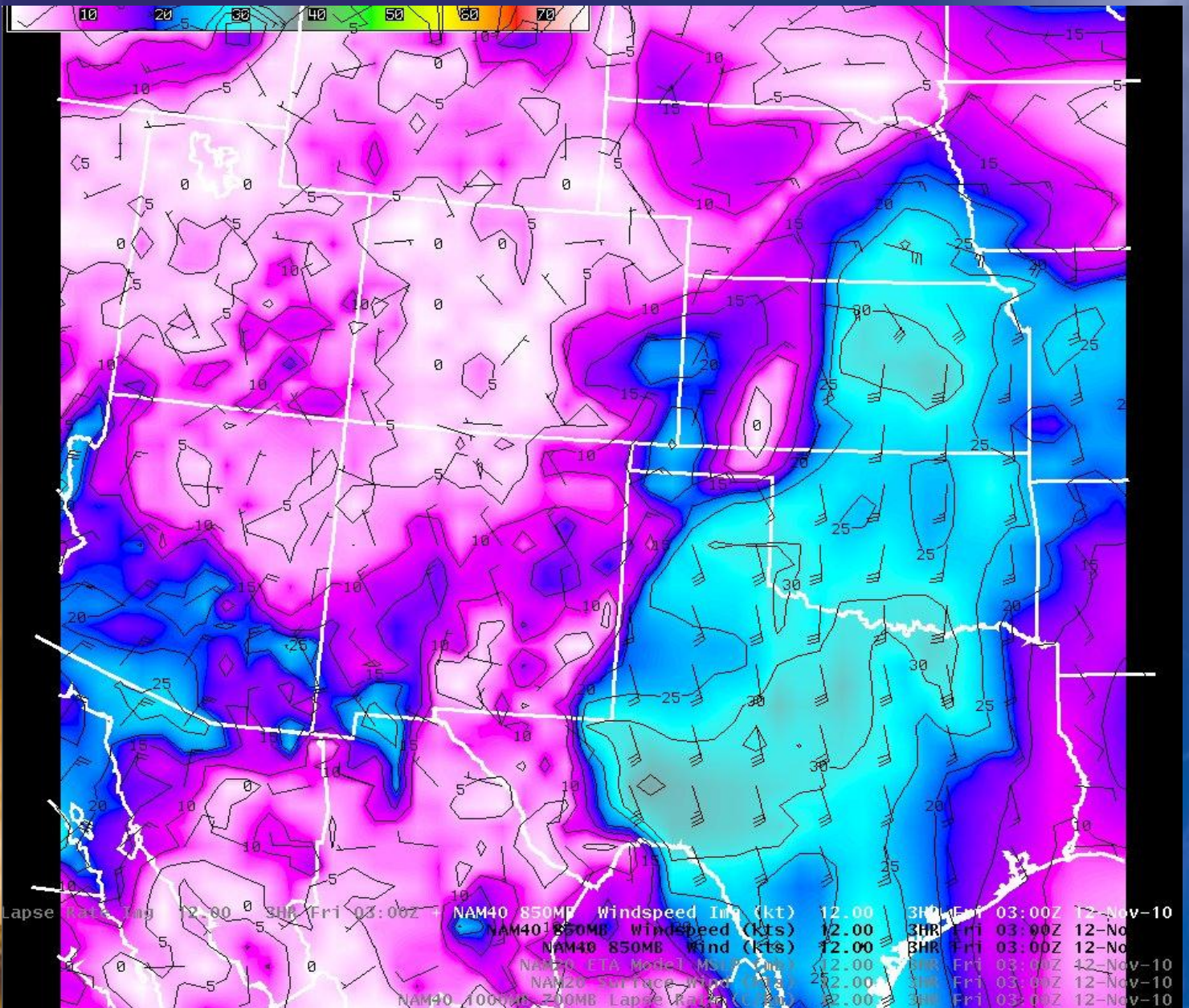
- Strong frontogenetic forcing between 850-700 MB
- Negative equivalent Potential vorticity (EPV) above that layer indicated some instability present which likely led to the enhanced convective nature of the snow

Event Setup



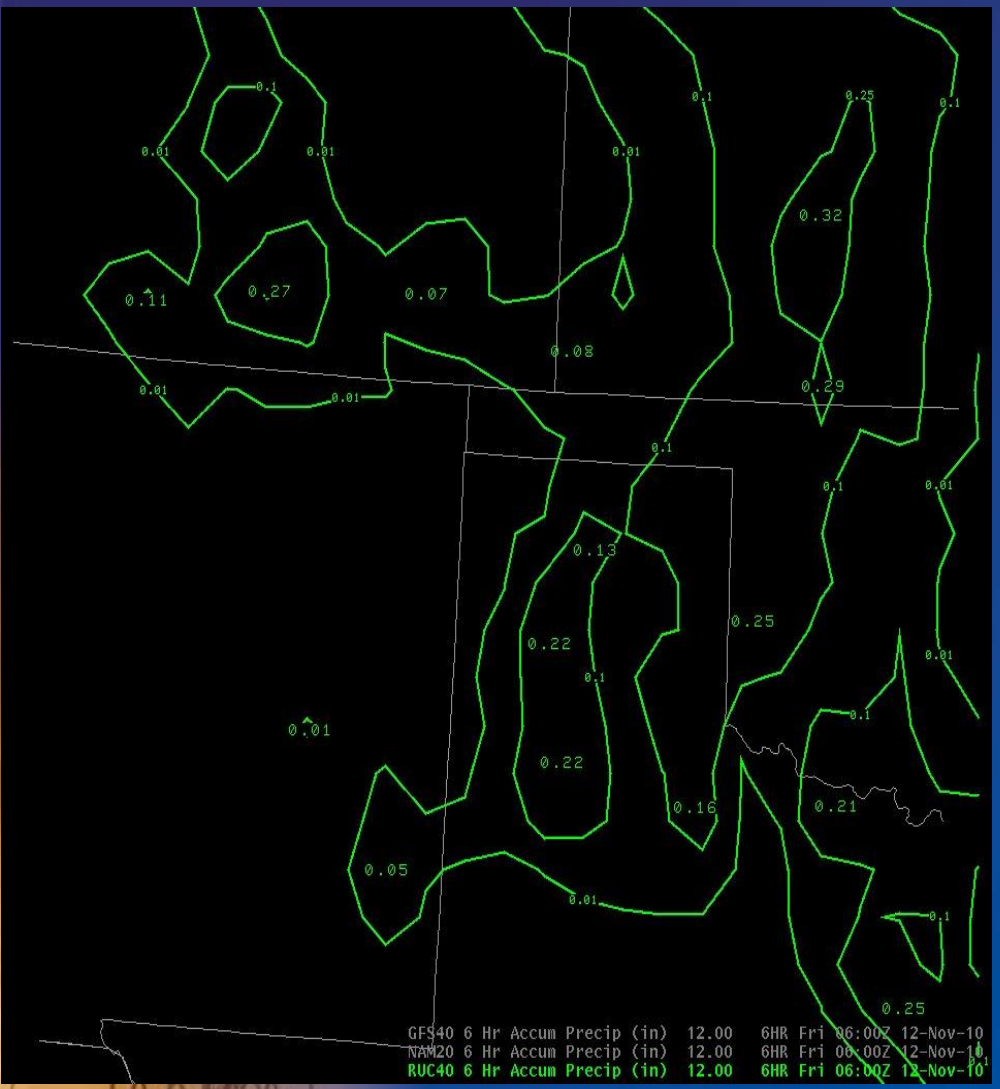
Steep 700-500 MB lapse rates largely contributed to sustaining the convection after 00 UTC Nov 12.

Event Setup



A 30 to 40 knot low level jet continued to provide gulf moisture to the Southern Plains, keeping the atmosphere primed for convection.

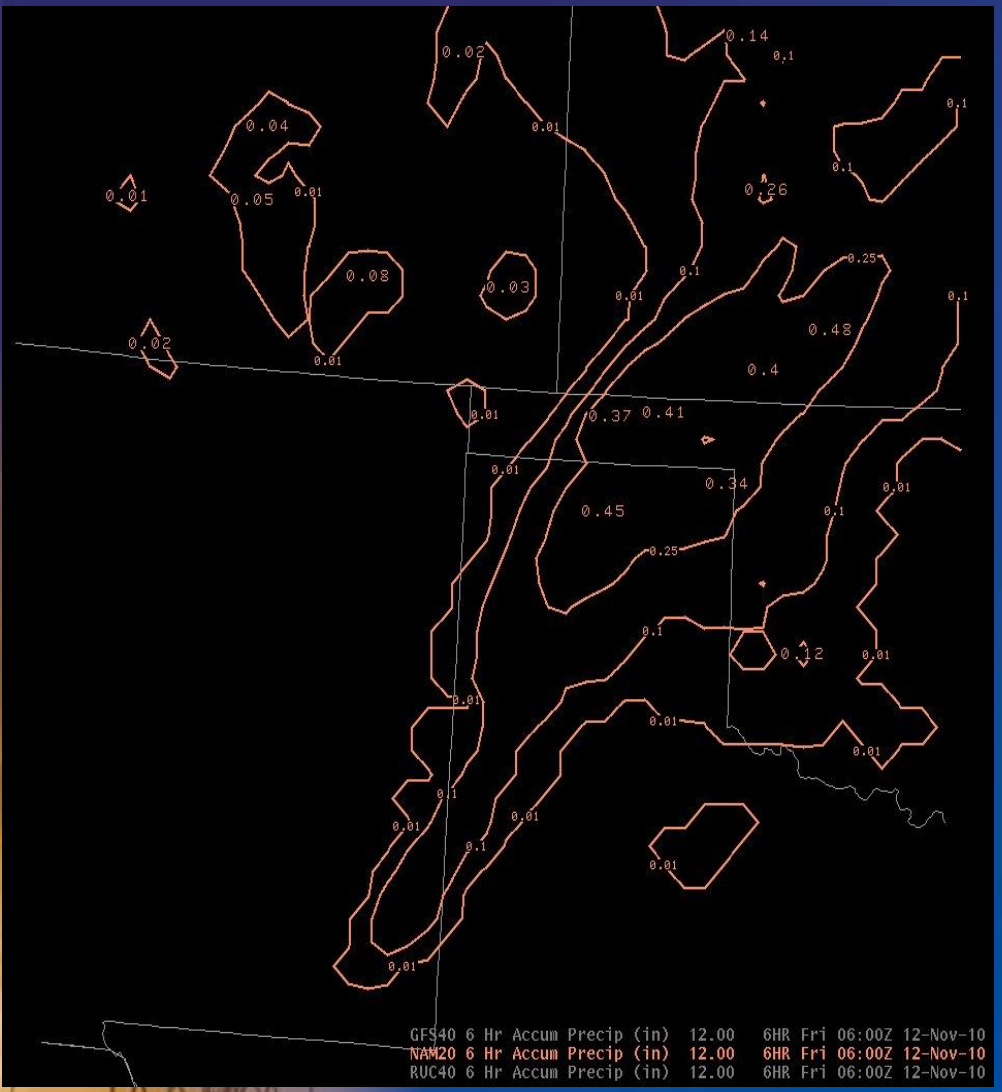
Model Output



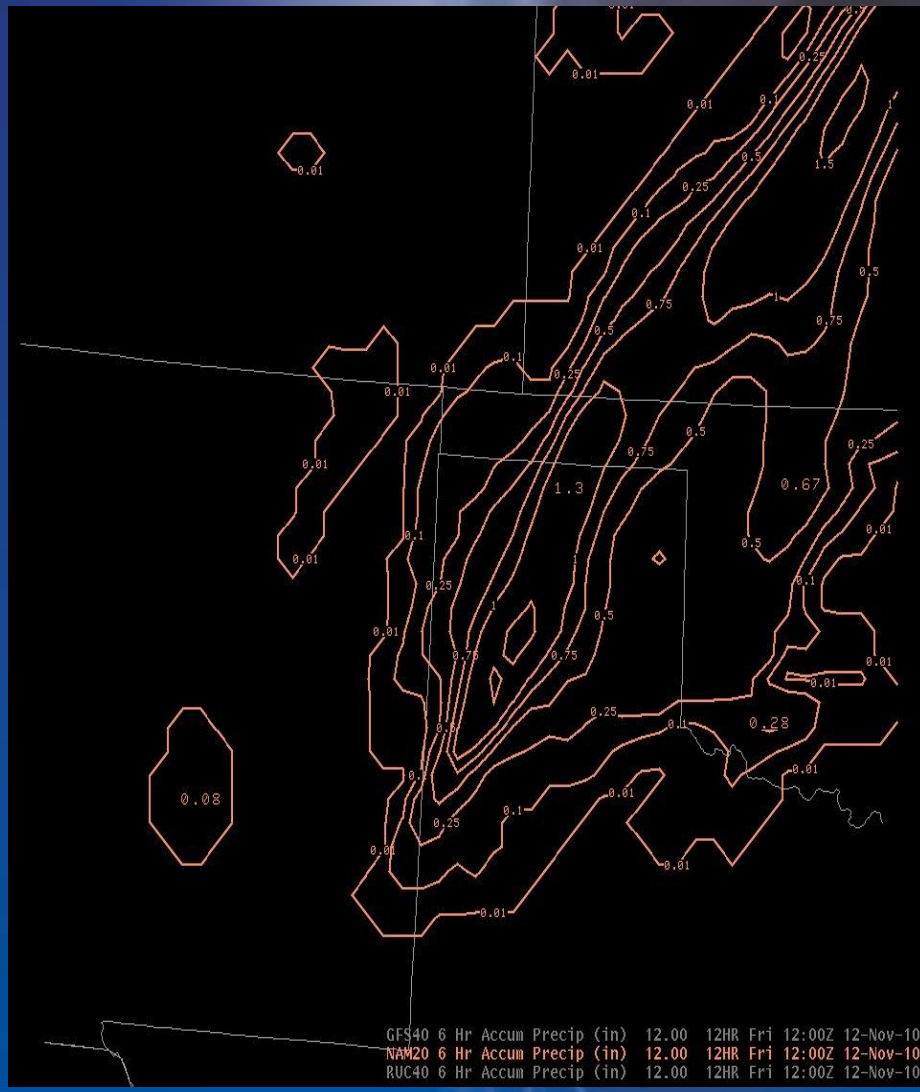
RUC 6 hour precip 06Z Fri Nov 12

RUC 6 hour precip 12Z Fri Nov 12

Model Output



NAM 6 hour precip 06Z Fri Nov 12



NAM 6 hour precip 12Z Fri Nov 12

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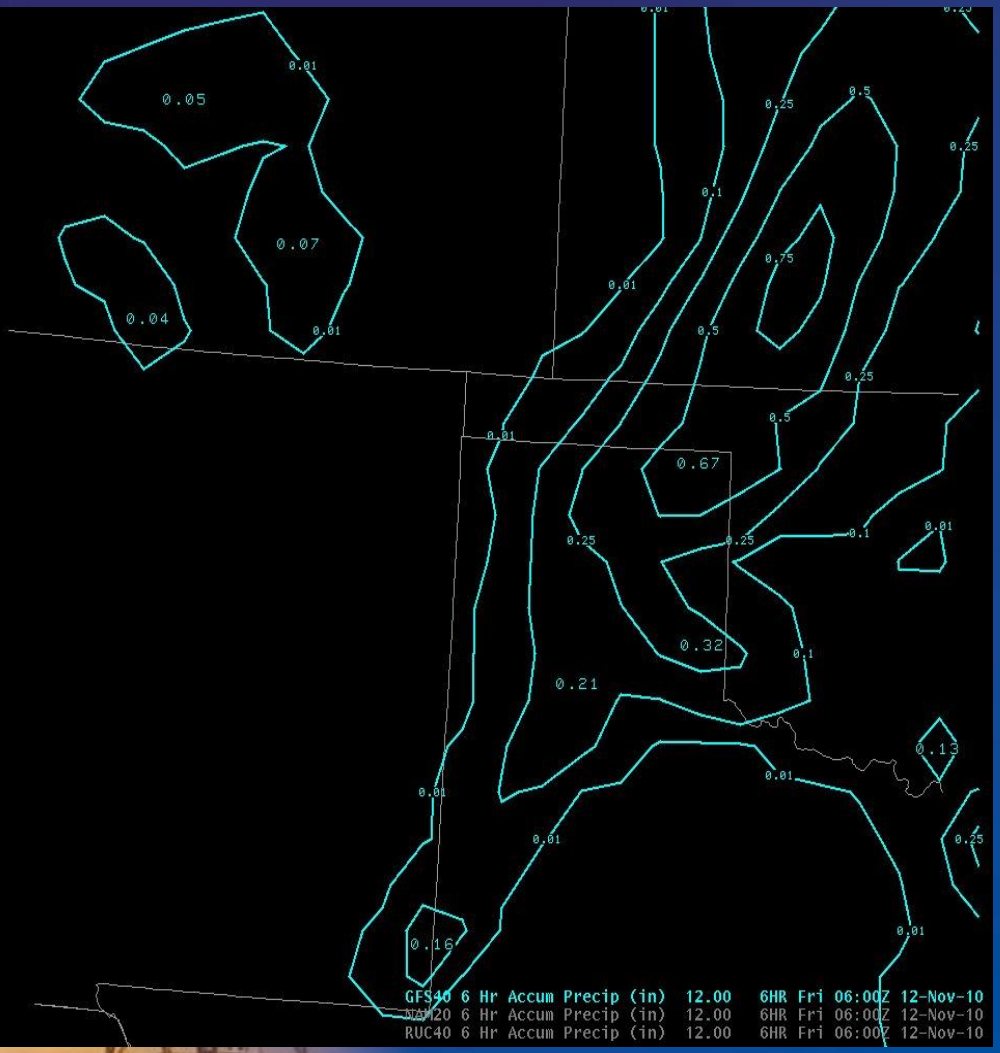
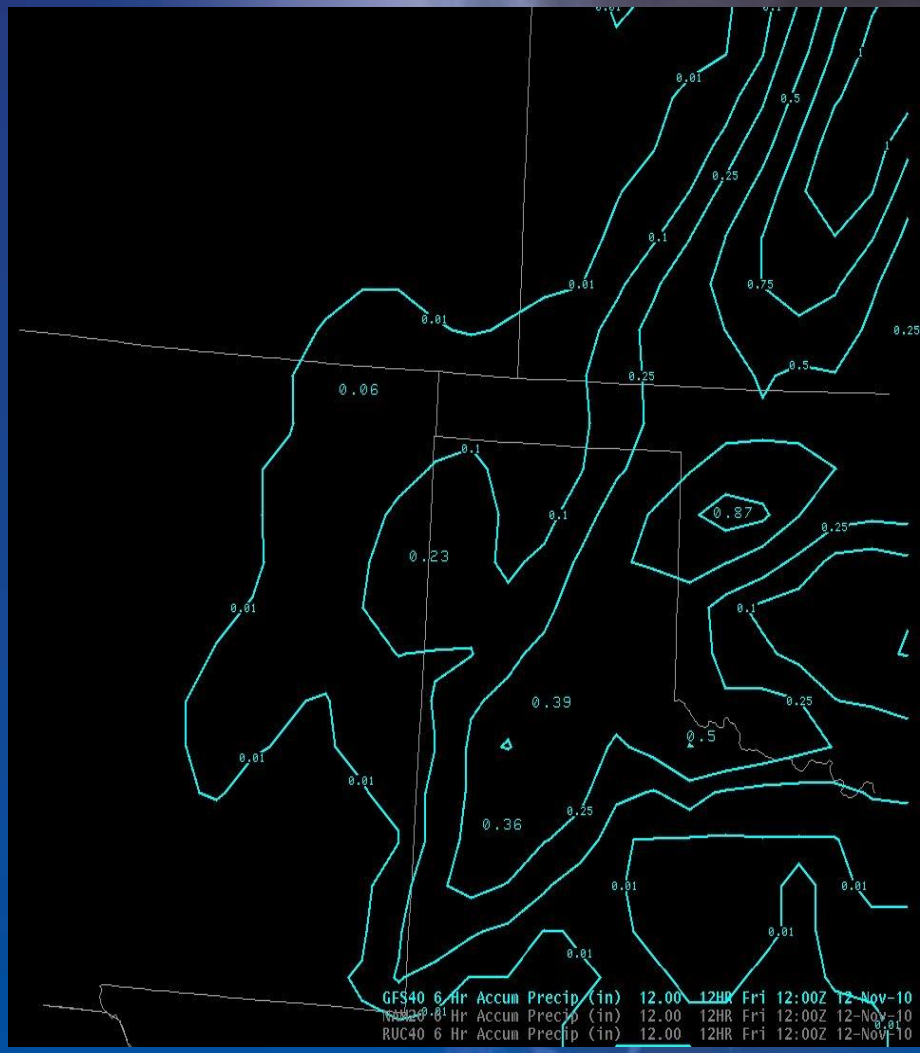
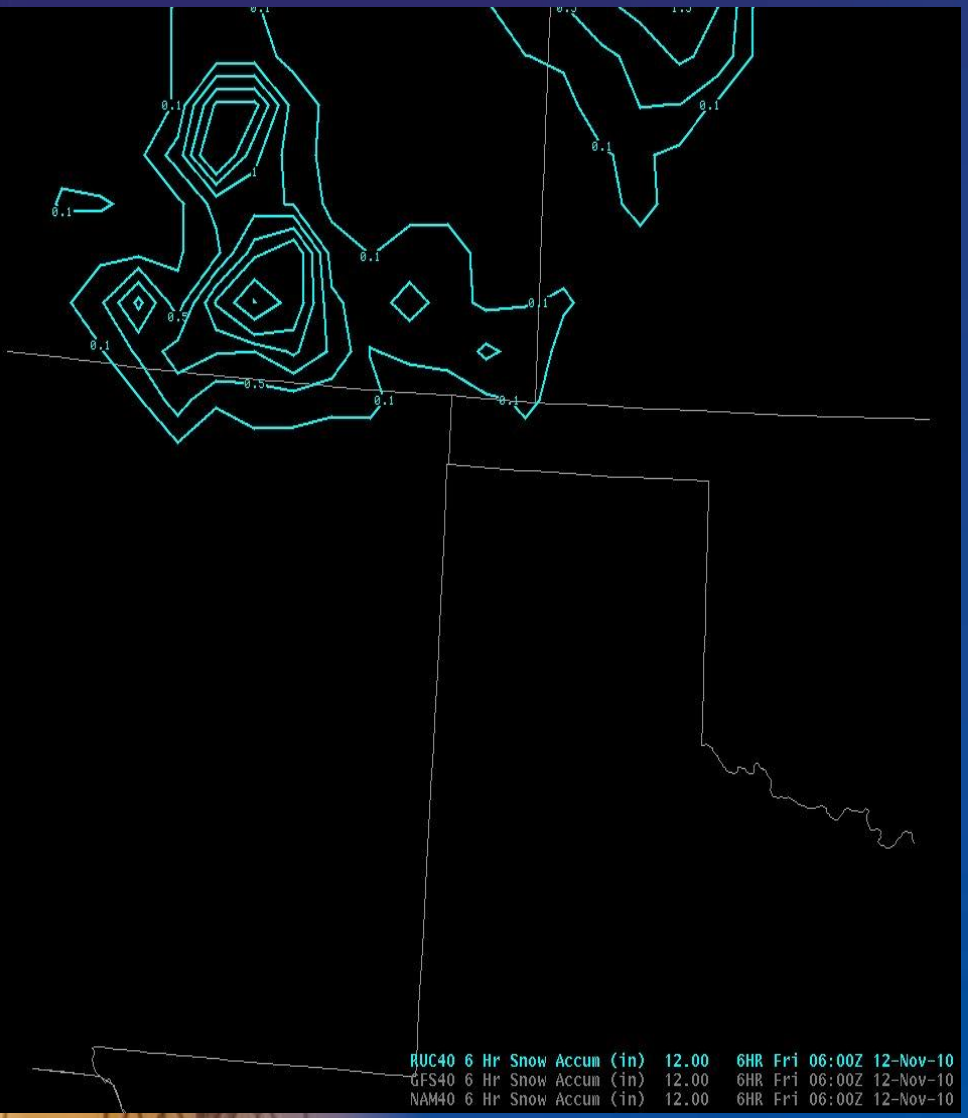


GFS 6 hour precip 06Z Fri Nov 12

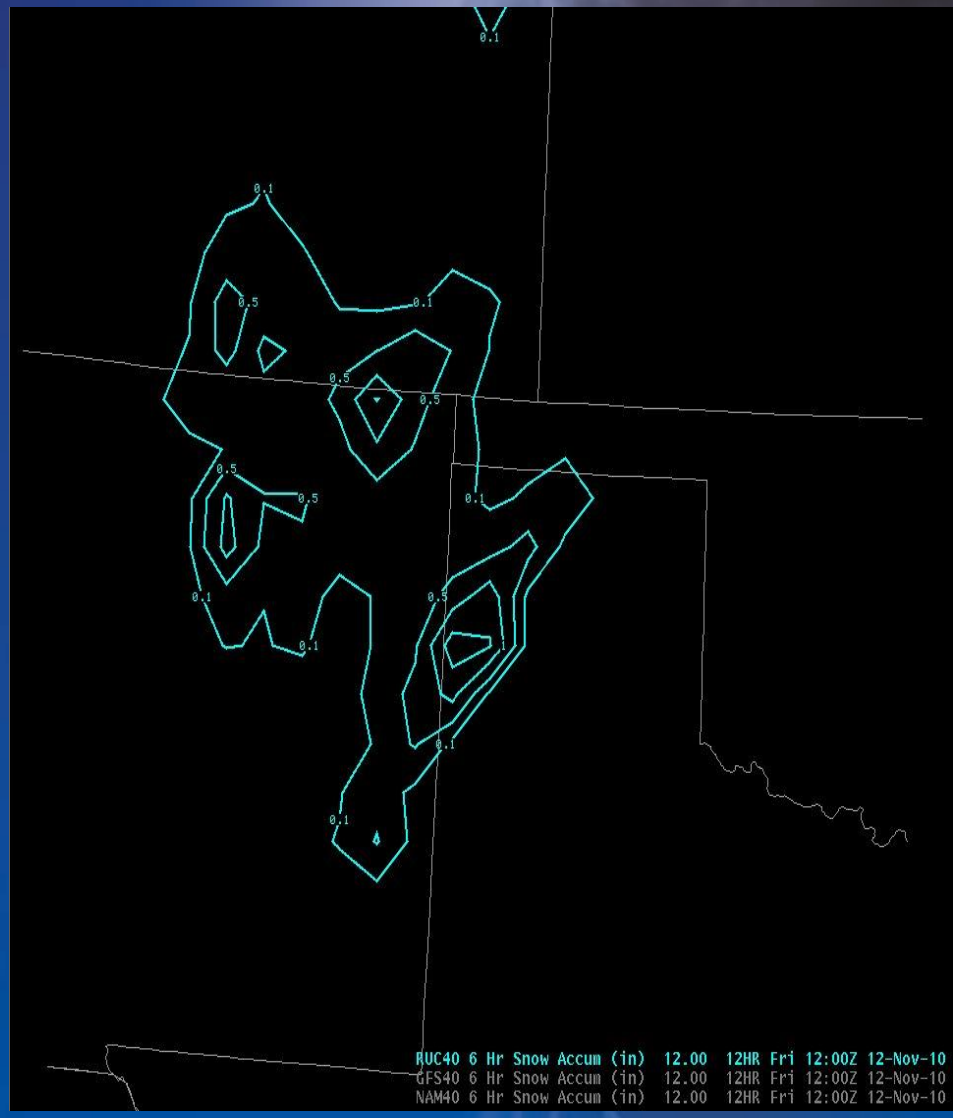


GFS 6 hour precip 12Z Fri Nov 12

Model Output



RUC 6 hour snowfall 06Z Fri Nov 12



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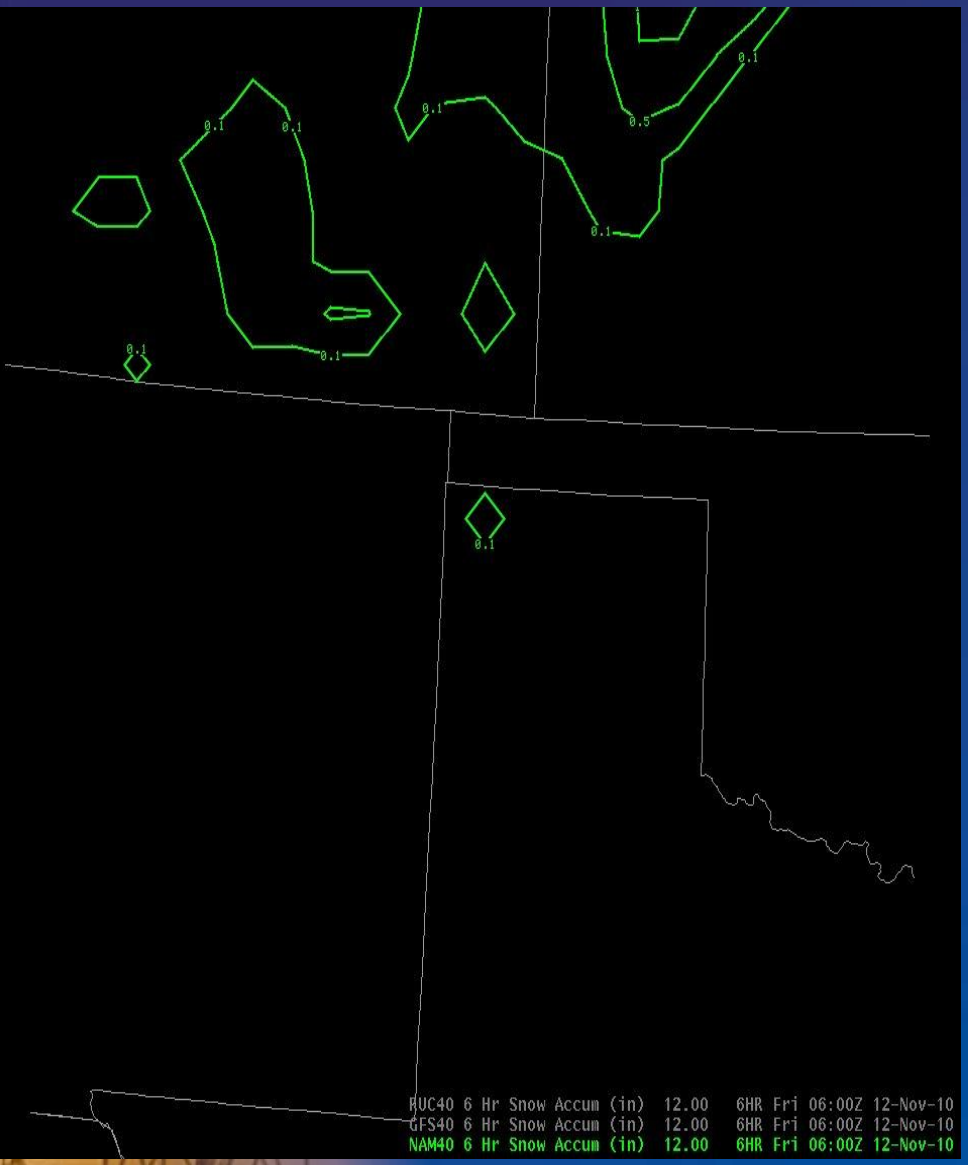

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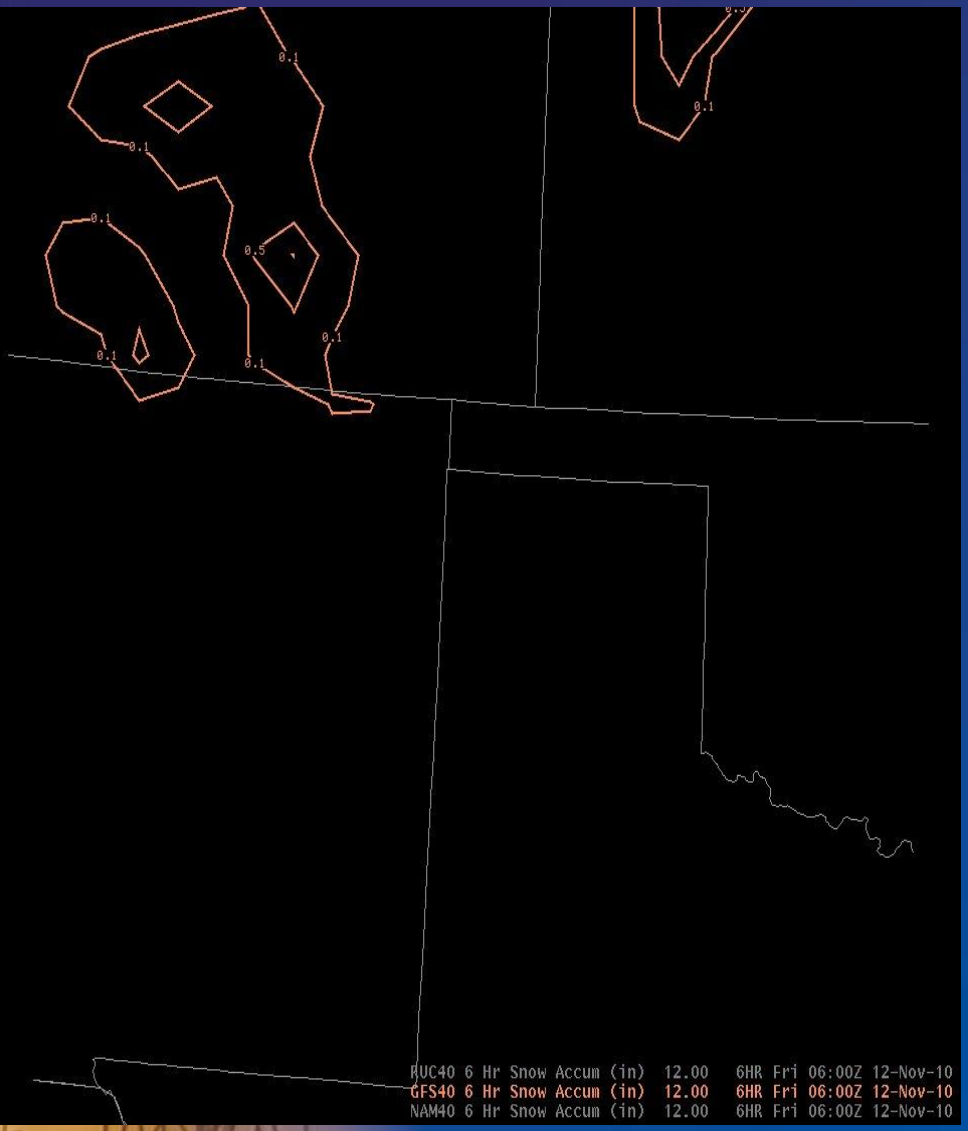
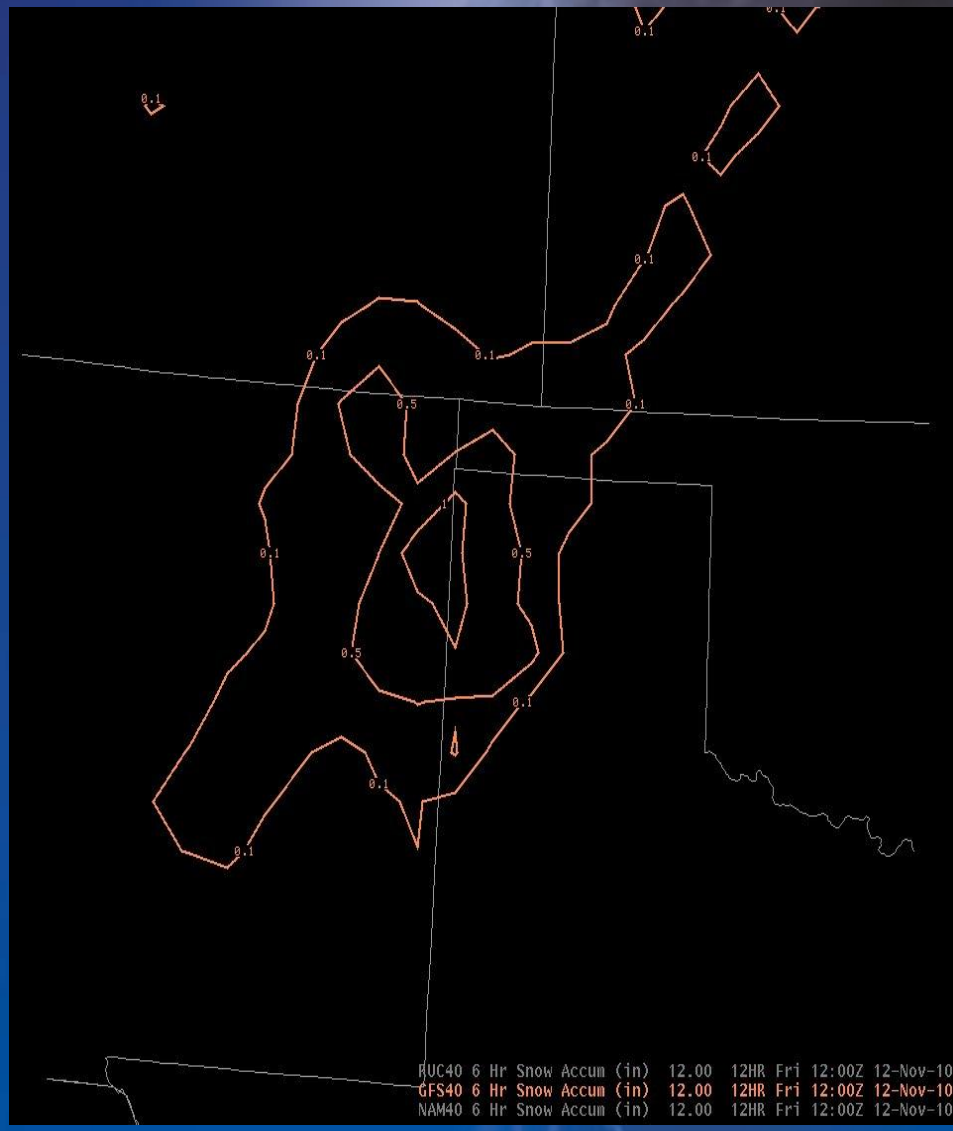


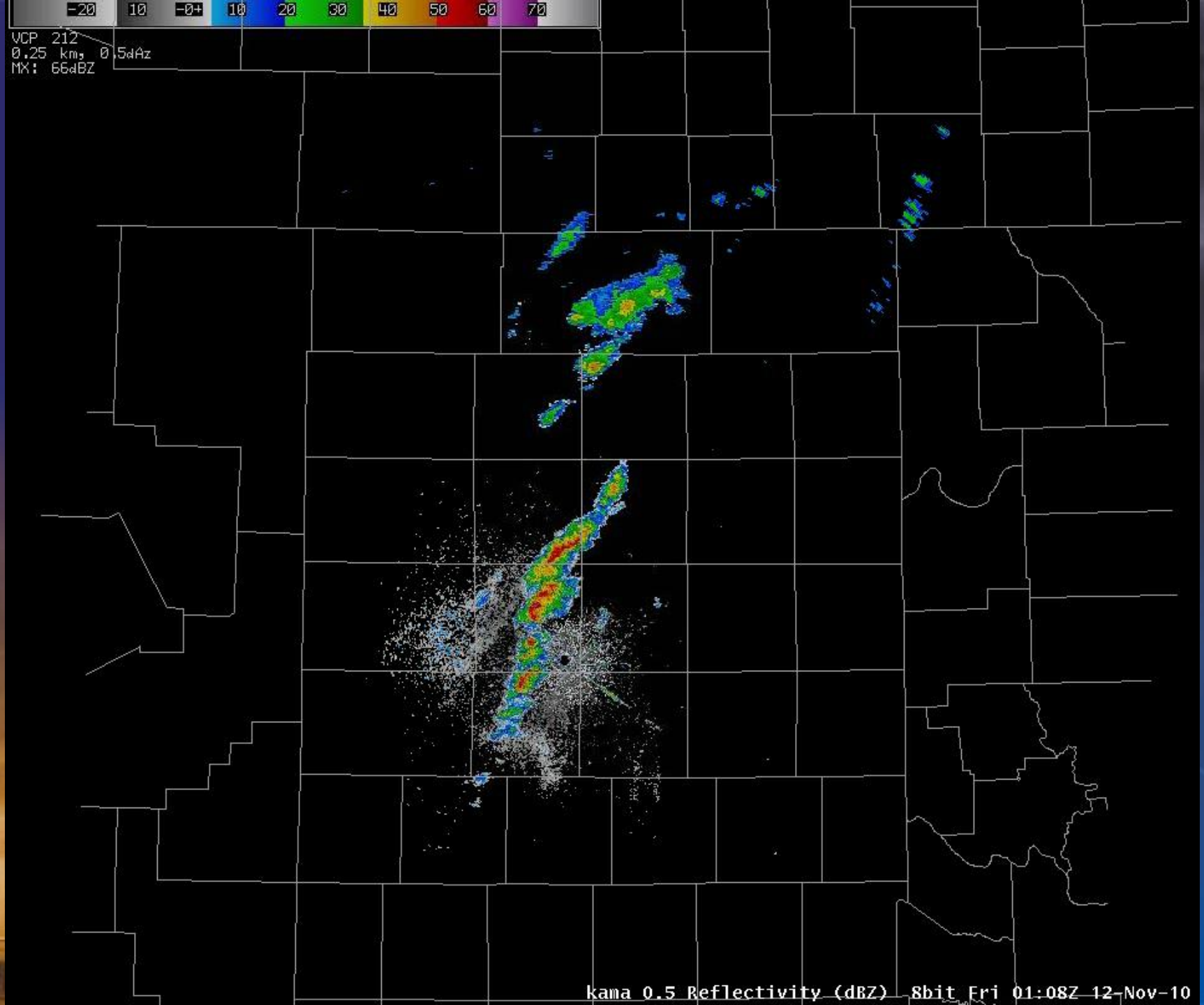
GFS 6 hour snowfall 06Z Fri Nov 12

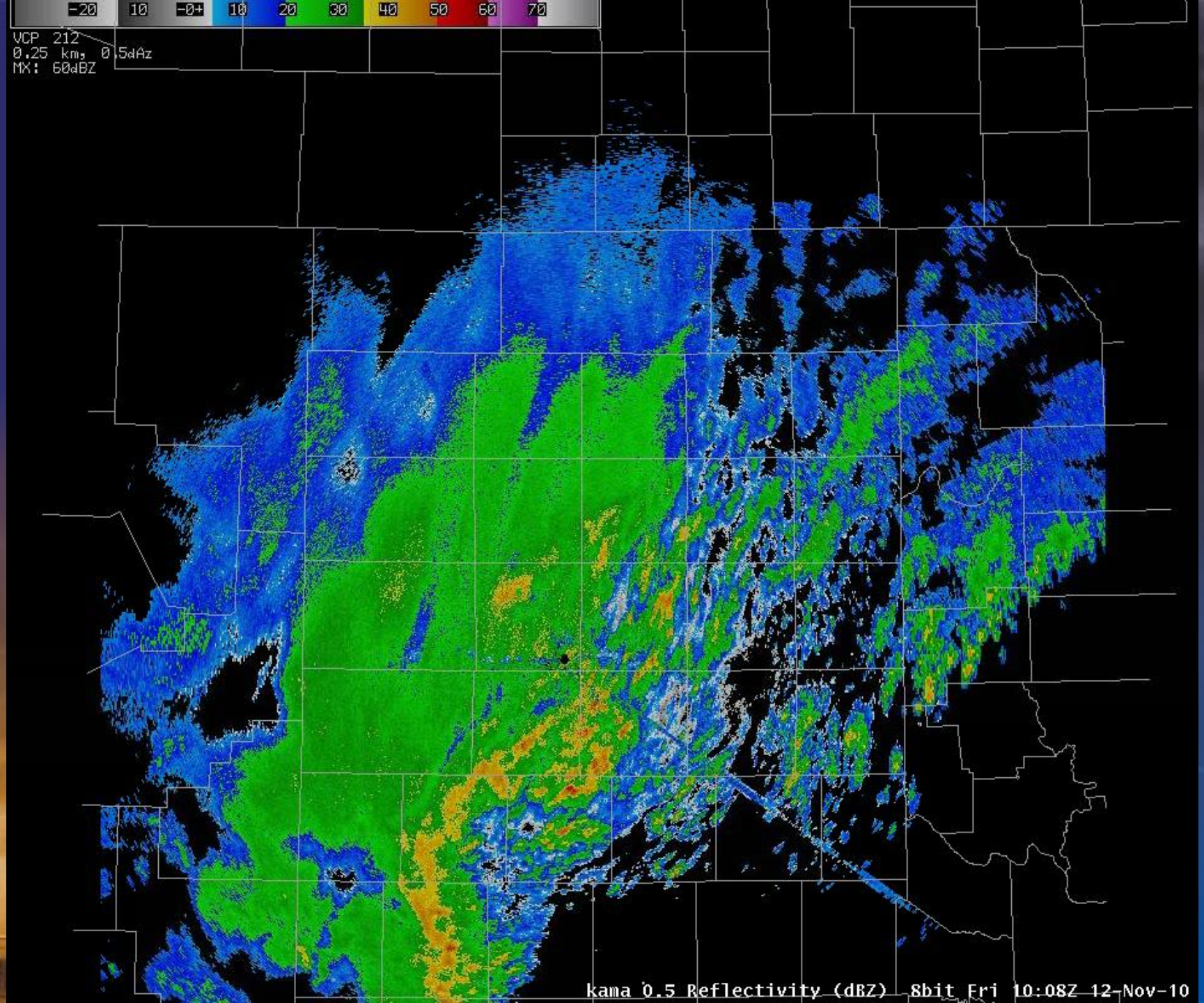


GFS 6 hour snowfall 12Z Fri Nov 12

Model Performance

- Models exhibited poor agreement during the early part of the week with the speed and timing of the upper level trough.
- The 12 UTC Wednesday European run drastically changed and indicated a slower and wetter system.
- The subsequent 00 UTC Thursday runs of the NAM and GFS followed suite and depicted a similar scenario as the European.
- The models all did poorly on snowfall predictions. They were way underdone and too far northwest with the snow. They didn't catch on it at all until the snow was basically occurring, which is of little to no use by the time the model data arrived.


-20 10 -0+ 10 20 30 40 50 60 70
VCP 212
0.25 km, 0.5dAz
MX: 66dBZ
kama 0.5 Reflectivity (dBZ) 8bit Fri 01:08Z 12-Nov-10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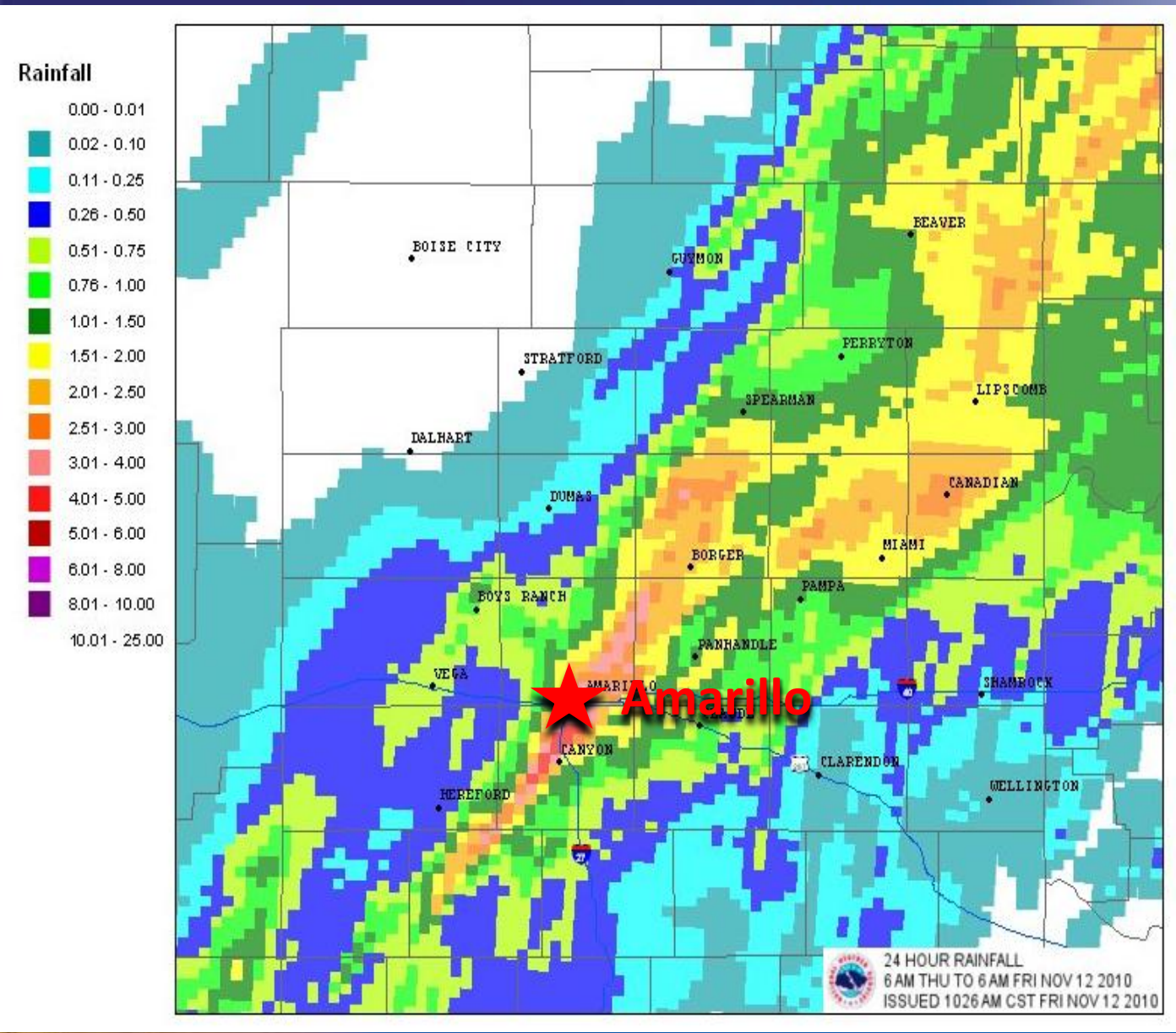
MX: 60dBZ
Kama 0.5 Reflectivity (dBZ) 8bit Fri 10:08Z 12-Nov-10

What Happened?



Widespread rainfall totals of 1 to 3 inches with localized 3 to 4 inches were reported across various parts of Potter and Randall counties.

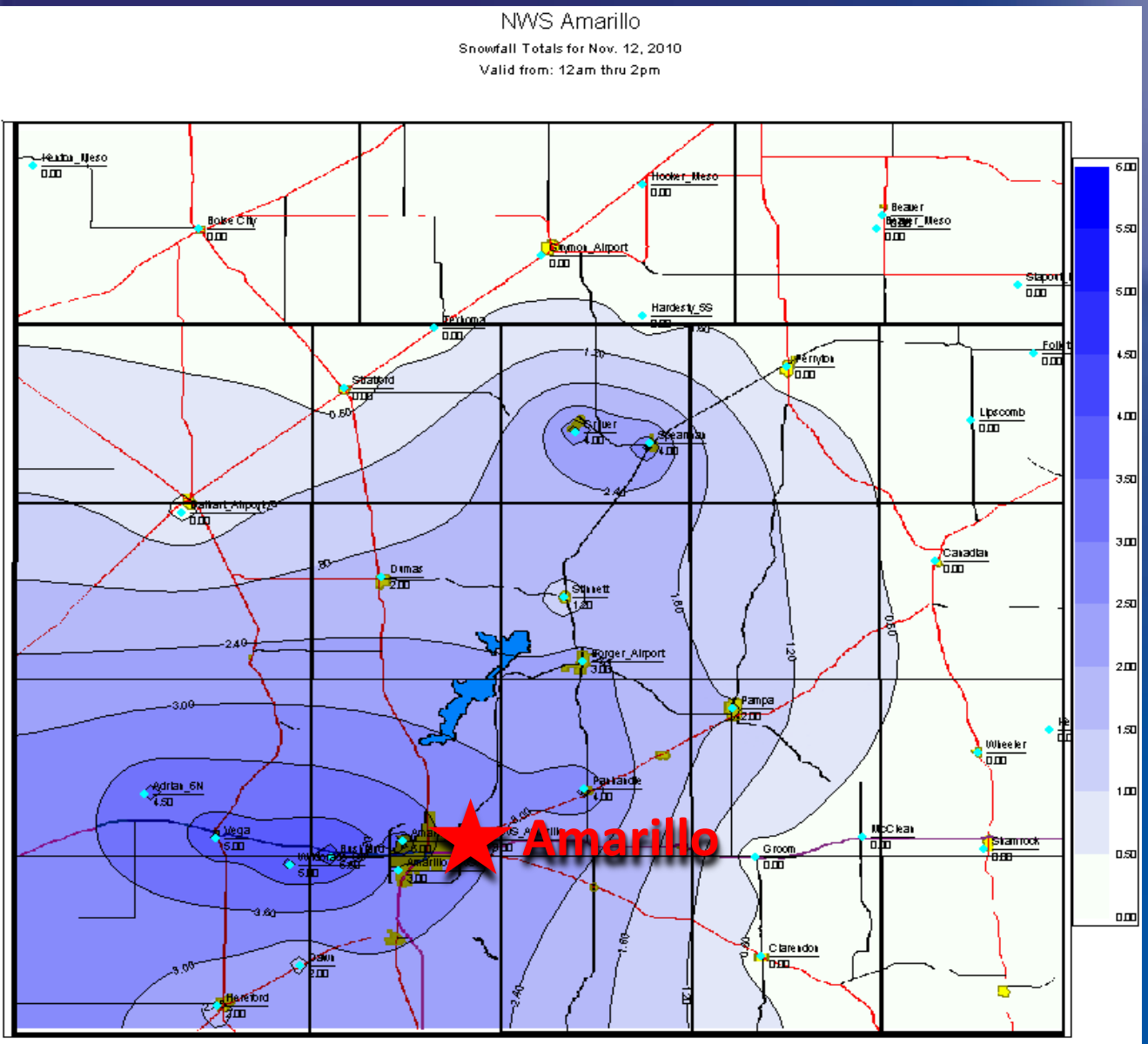
Amarillo officially recorded 2.88 inches of precipitation

What Happened?

Training thunderstorms moved to the north northeast for the better part of 3 to 4 hours across the south central and central Texas Panhandle, repeatedly impacting the city of Amarillo.

The end result was major flooding in Amarillo with numerous reports of stalled cars and high water rescues at several of the Interstate 40 overpasses. Eventually, Interstate 27 between Hillside and Georgia was closed for some time due to impassable conditions and stranded vehicles.

What Happened?



- The transition to snow started between 3 and 4 AM and tapered off by around noon.
- Bull's eye of 5.5 inches of snow fell 5 miles west of Amarillo
- 3 inches of snow fell at the NWS office
- Second bull's eye of 4 inches of snow fell at Gruver, located in the northern Texas Panhandle

Thank You!

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WFO Amarillo

Tree branches weighted down by snow on south Tyler Street in downtown Amarillo. Image courtesy of the Amarillo Globe News.