

Central U.S. Winter Storm

16-18 November, 2015

By: Jason Krekeler, WPC Meteorologist

Meteorological Overview: A significant winter storm affected portions of the central U.S. from 16 November to 18 November 2015 with snowfall of up to 30 inches (Figure 1) over southwestern Colorado. A deep upper-level low was the main driver of heavy winter precipitation across the southern Rockies, transitioning to a surface low in the lee of the Rockies by 0000 UTC, 17 November (Figure 2). By 1200 UTC, 16 November a deep 500 hPa trough was centered approximately over Las Vegas, Nevada. A southwesterly upper-level jet at 300 hPa was present over the Four Corners region and divergent upper-level flow was in place over the region about to be affected by heavy snowfall. Upstream, a strong northerly jet core was entering the base of the upper-level trough suggesting a deepening of the trough was imminent. By 0000 UTC, 17 November the deepened 500 hPa low was now centered over the Four Corners region, and a strong 700 hPa jet of between 35 and 50 knots was intercepting the higher terrain of New Mexico and southern Colorado, with orographic lift bringing heavy snow to favored southwest-facing slopes. Much of the heavy snowfall had taken place by 1200 UTC, 17 November across southern Colorado. Snowfall totals of 12 inches were reported in Breckenridge and 14 inches at Wolf Creek Pass.

With the 500 hPa low centered over the northern Texas panhandle by 1200 UTC 17 November, the strongest upslope flow and heavy snow shifted to the eastern slopes of the Rockies. A second feature supporting heavy snowfall by this time was the trough on the northwest side of the surface low located over western Kansas. A strong 850 hPa front was observed across northwestern Kansas where a band of locally heavy snowfall had developed. Low-level warm and moist air was being transported northwestward up and over the low-level baroclinic zone resulting in intense vertical motions and mesoscale banding. As much as 20 inches of snow was observed in this narrow band across northwestern Kansas. By 0000 UTC, 18 November the storm was mature with the low pressure center vertically stacked from the surface to the upper levels, and beginning to weaken. Some light snow continued as the low lifted toward the Midwest but ended as the storm moved away from the higher terrain.

Impacts: The higher elevations of the southern Rockies received as much as 30 inches of snowfall. Locations on the east slopes of the Rockies saw as much as two feet of snow including the metro areas of Colorado Springs with 16 inches and Denver with 7 inches. A narrow band of heavier snowfall stretched out into northwestern Kansas; 20 inches of snow was observed in Colby and 7 inches in Goodland. High winds were also a major factor in this storm. Blizzard conditions were observed across portions of Colorado, New Mexico, and Kansas with wind gusts over 60 mph. A 174 mile stretch of I-70 was closed due to local white out conditions and many flights out of Denver were cancelled on 17 November. A 55 mile stretch of I-25 in southern Colorado and northern New Mexico was also closed on 17 November due to icy conditions and spin outs.

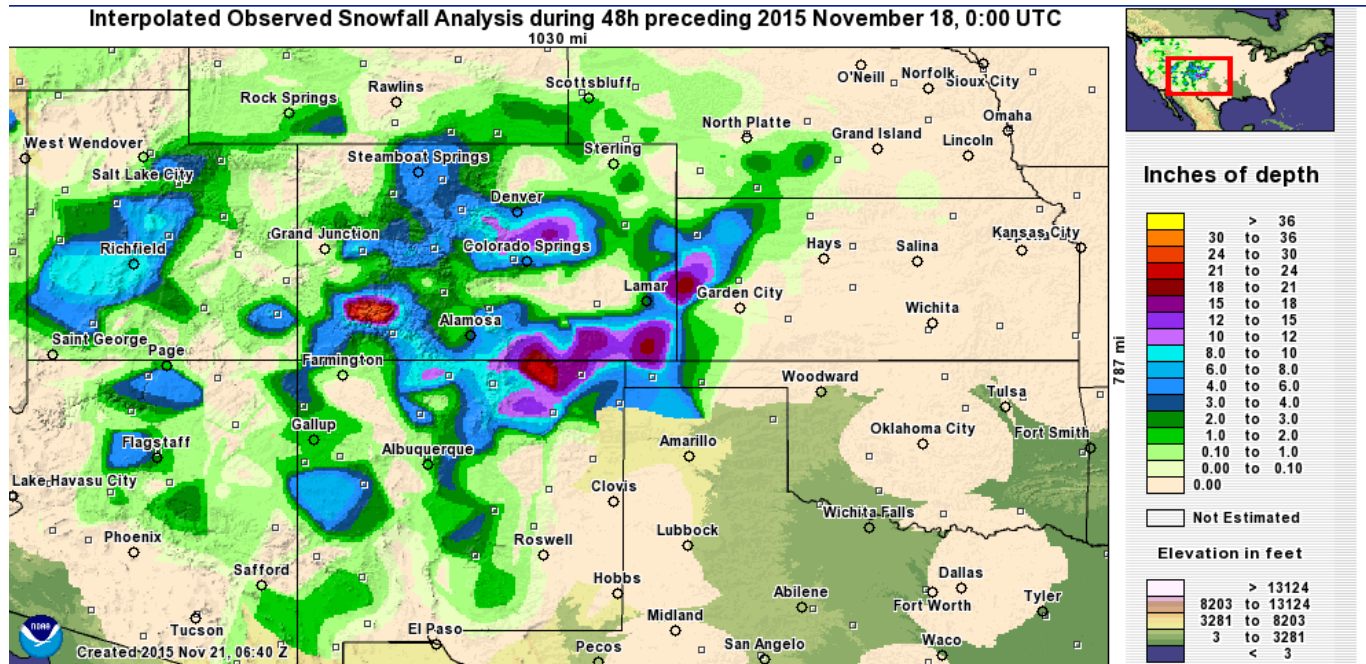


Figure 1: Map showing snowfall amounts over a 48 hour period from 16-18 November 2015 (NOHRSC).

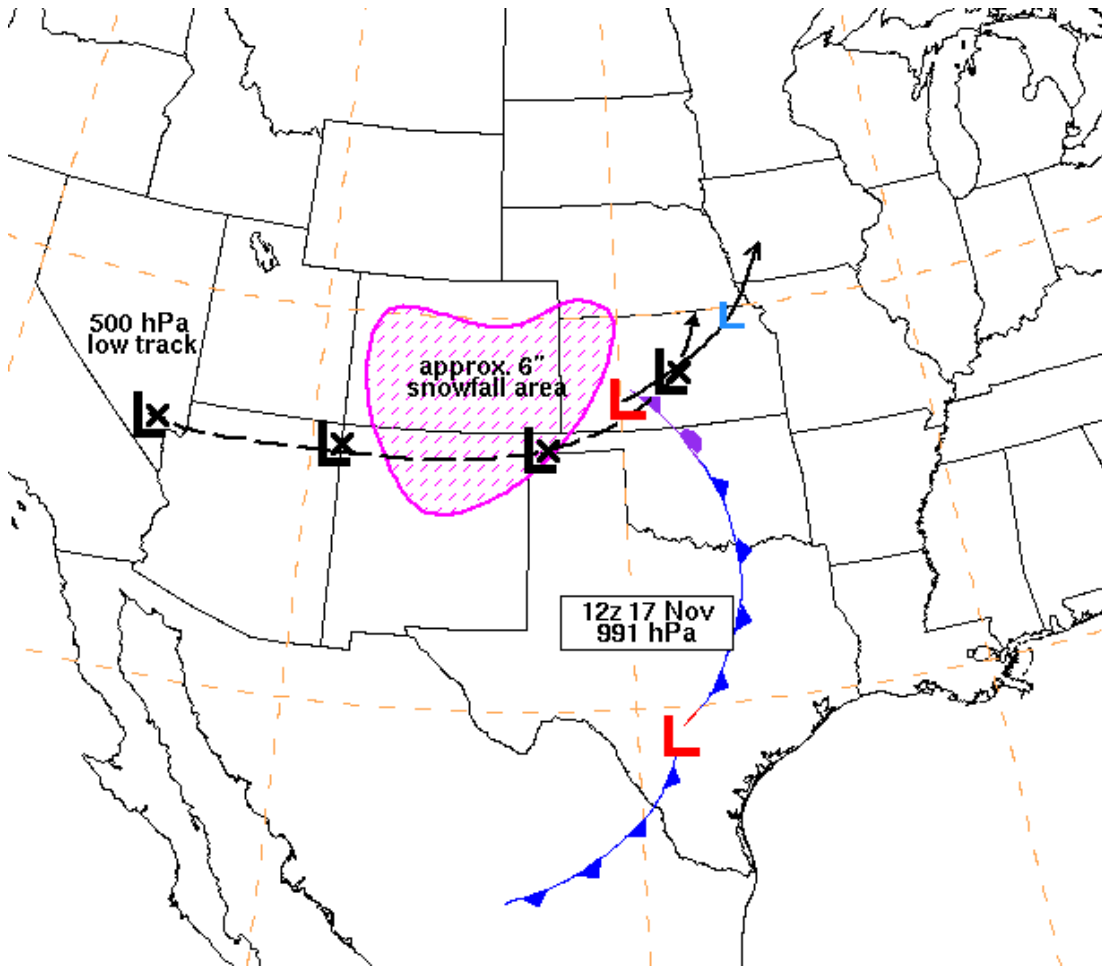


Figure 2. Map showing surface fronts and 500 hPa low track as well as approximate area receiving 6 inches of snow.