

Central Rockies to Mid-Atlantic Winter Storm

11-14 January, 2019

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Meteorological Overview:

An impactful winter storm brought snow from the central Rockies, the Midwest and Mid-Atlantic January 11-14, 2019. This storm was associated with a southern stream trough that originated from the Pacific on January 9. This trough shifted southeast from northern California and reached Arizona by January 10. This open southern stream trough with a slight positive tilt then shifted east and reached the southern Great Plains by January 11. Snow developed over the central Colorado Rockies and eastern slopes to the High Plains as the mid-level trough axis pushed across early on January 11 with generally 6-12 inches in the high terrain and in a swath east from the Sangre de Cristo mountains in the southern part of the state. Gulf moisture was tapped once the low level center shifted east of the southern Rockies with broad cyclonic flow up the southern into the central Great Plains. Light to moderate precipitation developed in the morning over Oklahoma and Arkansas and spread north and west around the surface low that continued to shift east. An area of freezing rain developed in northern Arkansas and southern Missouri from January 11-12. Lift and frontogenesis along the north side of the low allowed bands of snow to develop as is typical on the north side of such lows. A stripe of moderate to locally heavy snow developed over central Missouri, central Kansas and into the High Plains of Colorado by 00Z January 12. This swath of snow expanded and intensified between 00Z and 12Z January 12, extending from southern Indiana all the way across Kansas and reaching north into Iowa and southeast Nebraska. During this time the mid-level trough axis took on a slightly negative tilt as it crossed the Mississippi River. This pivot on January 12 allowed central Missouri to have the longest duration of moderate to heavy snow. The northward extent of precipitation was limited to roughly the north sides of Illinois and Indiana from a deep 1040 hPa surface high pressure centered north of the Great Lakes.

As the system shifted east from the Mississippi River a reinforcing shortwave rounded the trough, digging to the Gulf Coast and allowing the trough axis to take on a more negative tilt. The original surface low weakened as it moved over the Mid-South states late on January 12 with a new surface low developing over Alabama and Georgia on January 13. Furthermore the January 13 00Z low level analysis depicted a closed low at 850 hPa over eastern Kentucky. This low level feature contracted precipitation to along and south of the Ohio River Valley and the southerly flow ahead of this low lead to warming over West Virginia. Therefore a notable decrease in snowfall occurred as the precipitation shield shifted east from Indiana to Ohio into January 13. Little snow fell in southern West Virginia with some freezing rain reported on the 13th.

The high pressure over Canada spread east with a surface ridge extending to the northern Mid-Atlantic by 12Z on the 12th. A cold air damming wedge extended down the east side of the Appalachians to the southern Mid-Atlantic, priming the area for wintry precipitation spreading east from the trough. Southerly flow up the Eastern Seaboard that tapped both Gulf of Mexico

and Gulf Stream moisture combined with the advancing forcing from the mid-level trough to produce a separate area of moderate precipitation. By 00Z on January 13, a continuous swath of snow extended from Kansas City to Delaware. Precipitation blossomed on the 13th from the central Mid-Atlantic to the Carolinas with moderate rates common. The strong cold air damming and surface low pressure developing over the coastal front along the Carolina coast allowed shallow cold air to persist over the Carolinas with extended light to moderate freezing rain over the Carolina Piedmont and southern Blue Ridge foothills.

Further shortwave activity around the trough maintained bands of snow over the southern Delmarva until about 12Z on January 14.

Impacts:

Central Rockies to Midwest

This storm impacted areas from the central Rockies to the Mid-Atlantic over a few days. 350 flights were cancelled for the middle of the country portion of the storm with the St. Louis airport most impacted with 115 cancellations. The 10.9 inches of snow at St. Louis airport ranks as the 15th greatest two day snowfall in the St. Louis area on record. The heaviest snow was across the central portion of the state northwest of St. Louis. Just outside Columbia 20.3 inches were recorded. The official measurement in Columbia was 16.3 inches, good enough for third all time for greatest two-day snowfall where records date back to 1889.

The Missouri State Highway Patrol reported more than 800 vehicle crashes and four fatalities. It also responded to almost 1,800 stranded drivers. In Kansas, at least three people died in crashes related to the weather, according to the state highway patrol. The Illinois State Police said during a period of about 20 hours from the 11th into the 12th it responded to nearly 300 traffic crashes, one of which was fatal. Later on Saturday, a state trooper was struck by a car and killed while investigating a crash in a Chicago suburb, according to the state police.

<https://www.nytimes.com/2019/01/12/us/winter-snow-storm.html>

<http://fortune.com/2019/01/12/flights-canceled-winter-storm-gia/>

Mid-Atlantic

Snow and ice related impacts were felt over the central Mid-Atlantic and portions of the Carolinas. A swath of 6-12 inches of snow was reported over the central Mid-Atlantic region. 10.2" at DCA is the 18th highest two day snowfall since the airport opened in 1941. Several quarter inch or higher ice reports came in from across western NC and southwestern VA with a pocket of half inch reports in western NC.

One highway fatality was blamed on slick road conditions on Interstate 81 in Virginia. The Virginia State Police said they responded to more than 300 traffic crashes and helped nearly 200 disabled vehicles in Virginia on January 13. The storm knocked out power to nearly 200,000 people in Virginia and North Carolina at its height Sunday, according to PowerOutage.us.

Meanwhile, the storm caused more than 250 flight cancellations Sunday at the three main airports serving the nation's capital. North Carolina declared a state of emergency after the storm knocked out power to roughly 98,000 customers.

<https://abc11.com/weather/cooper-declares-state-of-emergency-after-snow-ice-storm/5073161/>

<http://www.spokesman.com/stories/2019/jan/13/wintry-mix-of-snow-freezing-rain-pummels-mid-atlan/>