

Southern Plains to Northeast Winter Storm

2/16 - 2/18 2021

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Meteorological Overview:

A potent upper level trough tracking through the Southwest along with a record breaking Arctic air-mass in place throughout the Plains and Mississippi Valley fostered a favorable environment for significant and disruptive wintry weather. On Tuesday, February 16, an area of low pressure began to organize off the Texas coast. Underneath the upper trough in the Southwest, mountain snow was common throughout the southern and central Rockies with locally heavy totals observed. Meanwhile, warm air advection out ahead of the upper trough caused periods of snow to break out in the Southern Plains. Freezing rain also developed across parts of south Texas Tuesday night and continued into Wednesday, February 17.

The new wave of low pressure off the Texas coast began to strengthen on Wednesday while a shield of wintry precipitation enveloped much of the South Central U.S. and stretched into the Lower Mississippi Valley. This is due to a broad area of upper level ascent co-located within the right entrance region of a lengthy jet streak that stretched from Texas to the northwest Atlantic. Rich moisture from the Gulf of Mexico ran into the bitterly cold air-mass stationed over the Mississippi Valley and the Mid-South, forcing precipitation to fall as snow and/or freezing rain. The heaviest snowfall rates were found in southern Arkansas where stronger low-level frontogenetic forcing and vertical motion was present. A swath of 3 to 6 inches of snow fell from southern Arkansas to the Tennessee Valley and central Appalachians on Wednesday. Just south of the snow axis a prolonged period of freezing rain generated significant freezing rain accumulations. Crippling ice totals over a half inch occurred in parts of the Lower Mississippi Valley with some totals approaching three quarters of an inch.

By Wednesday night, the right entrance region of a strengthening jet streak became positioned over the Southeast and Mid-Atlantic. Strong warm air advection and isentropic lift aloft led to vertical ascent that produced areas of snow and ice in the Appalachians and Mid-Atlantic the morning of Thursday, February 18. A heavy band of snow set up from the central Appalachians of Virginia and West Virginia and northern Maryland to southeast Pennsylvania and central New Jersey. Over a foot of snow fell in parts of the Appalachians while between 8 and 12 inches of snow was measured just north and west of Philadelphia. Heavy ice accumulations were common in the Piedmont of southern Virginia and northern North Carolina with totals up to a third of an inch. Periods of snow then reached the Northeast the second half of the day Thursday and into Thursday night as low pressure tracked off the Mid-Atlantic coast. Some snowfall did continue into Friday, February 19 across southern New England but concluded late in the day. Overall, 4 to 8 inches of snow accumulated along the I-95 corridor of the Northeast with some isolated totals over 8 inches.

Impacts:

This major winter storm exacerbated serious problems to travel, infrastructure, and commerce across parts of the South that were still being felt in wake of two prior winter storms. On the afternoon of February 15, over four million customers were without power across the Lower 48 with over 3.5 million in the dark in Texas alone. As the event unfolded from the 16th into the 17th, hundreds of thousands lost power in Louisiana and Mississippi due to the significant ice accumulations. Parts of southern Virginia and northern North Carolina that were already without power either continued to be without power during the storm or saw more areas lose power as a result of accumulating freezing rain on power lines and trees.

In terms of snow totals, Little Rock, Arkansas airport measured 11.8 inches on February 17, making it the single snowiest day at the airport on record and second snowiest for the city overall dating back to 1875. Memphis, TN reported 4.7 inches on the 17th, giving Memphis a monthly total of 10 inches. It capped what ultimately turned out to be the snowiest February at the airport on record. The event total of 3.3 inches at Nashville, TN airport, on top of the 1.9 inches that fell earlier in the month, put the monthly total at 5.2 inches, making it the snowiest month for the city since January 2016. Lastly, the 3.3 inches measured at Huntsville, AL airport made February 2021 the snowiest month witnessed there since February 2015. In terms of ice accumulations, some of the highest observed amounts were 0.70 inches in Harrisonburg, Louisiana, 0.63 inches in Collinsville, Mississippi, and 0.45 inches near Buffalo Ridge, Virginia.

The winter storm caused numerous school cancellations, travel delays by ground and by air, and also prolonged issues with infrastructure such as water pipes bursting. There were also plenty of COVID-19 vaccination sites that were forced to cancel appointments while poor travel conditions also delayed vaccine shipments to parts of the South and Mid-Atlantic.