

Southern Plains to Mid-Atlantic Winter Storm 16-17 February, 2015

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Meteorological Overview: A significant winter storm impacted a large area of the United States from portions of the southern plains to the Mid-Atlantic on 16 February through 17 February, 2015. The storm brought heavy snow, sleet, and freezing rain to many places, including less well-equipped areas of the southern plains, mid to lower Mississippi valley, Tennessee valley and southern Mid-Atlantic. Just a few days before this storm, a deep closed upper-level low and strong surface cold front swept through the eastern U.S. bringing well below normal and record low temperatures to much of the central and eastern states. This helped set the stage for the widespread winter weather event.

By 1200 UTC on 16 February 2015, an upper-level shortwave had ejected out of the central Rockies and was moving across the central and southern plains states. An area of low pressure was located at the surface in northern Texas, while a strong low to mid-level baroclinic zone had set up from the ArkLaTex region to the Tennessee valley. Very strong, on the order of 30 to 50 knots, moist southerly flow out of the Gulf of Mexico interacted with the baroclinic zone to support a large area of wintry precipitation from portions of the southern plains to the central Appalachians. Mostly snow fell to the north of the surface low and frontal boundary, but near the boundary itself, freezing rain and sleet occurred. As the surface low slowly progressed across the northern Gulf Coast states during the afternoon and into the evening of 16 February, the baroclinic zone lifted north and eastward into the southern Mid-Atlantic region. This helped to spread the heavy snow across the middle Mississippi valley, Tennessee/Ohio valleys, and into the Mid-Atlantic, with significant sleet and freezing rain spreading across portions of the Tennessee valley, the southern Mid-Atlantic, and even the Southeast.

The wintry precipitation came to an end from west to east across the Mississippi, Tennessee, and lower Ohio valleys early in the morning of 17 February as the surface low and front moved eastward, and higher pressure filtered in behind. Across the Mid-Atlantic, however, snow lingered a bit longer as a second area of low pressure developed just off the North Carolina coast and quickly moved away from the Atlantic coastline. While coastal areas of Delaware and southern New Jersey did see some light to moderate snow totals, the low remained far enough offshore to spare the bigger cities of New York City and Boston. This likely came as a relief after the series of storms in the preceding weeks, which blanketed some areas of the Northeast in several feet of snow.

Generally, the heaviest snow fell to the north of the frontal boundary from the Middle Mississippi valley to the southern Mid-Atlantic. Many places in this region saw totals ranging from 4 to 10 inches, with some places across eastern Kentucky, southern West Virginia, and extreme southwest Virginia recording anywhere from 12 to 20 inches. The highest recorded total from this storm was 18 inches near Coleman, Kentucky, but it's possible a few places saw amounts higher than this, especially in the higher terrain of the central/southern Appalachians. To the south of the snow area, from eastern Oklahoma to North Carolina, up to 3 inches of sleet and

three quarters of an inch of ice fell. Highest recorded sleet and freezing rain totals were 3 inches in Union City, Tennessee and 0.75 inches in Strawberry Fields, Tennessee, respectively.

Impacts: The dangerous mix of heavy snow, ice, and freezing temperatures led to very messy road conditions, numerous accidents, road closures, travel delays, and power outages all across the affected areas. Thousands of flights were either cancelled or delayed from the Deep South to the Northeast, with over 300,000 power outages reported in 14 states and the District of Columbia. Winter storm warnings and advisories covered a widespread area from portions of the southern plains to the Mid-Atlantic, affecting more than 47 million people. Governors declared states of emergency in several states, and even though many schools and businesses were already closed for Presidents' Day on Monday, 16 February, most also got an additional snow day on Tuesday, 17 February, as well. One fatality was directly attributed to the storm when a woman in Kentucky got hyperthermia after getting lost in the woods just prior to the start of the snow. However, the storm also indirectly contributed to the deaths of at least 10 people in Tennessee, Virginia, North Carolina, Kansas, and Indiana.

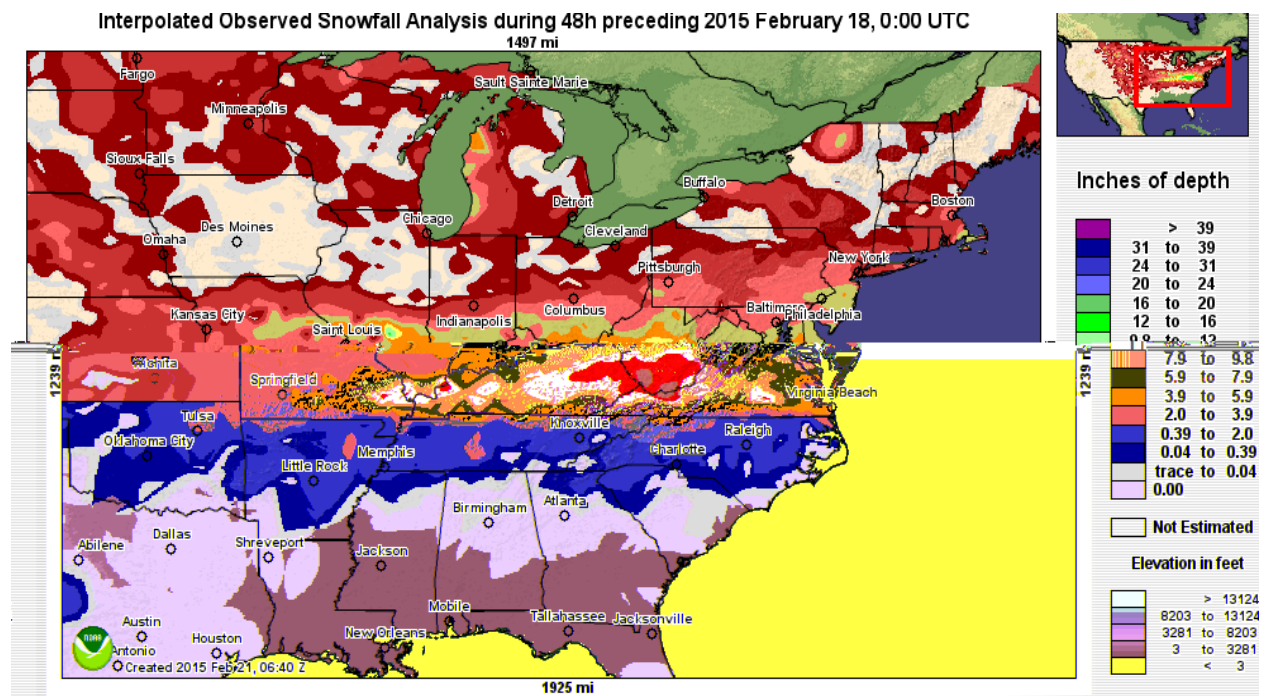


Figure 1: Total observed snowfall from 0000 UTC 16 February to 0000 UTC 18 February.



Figure 2: Graphic showing 500 hPa shortwave trough (black), surface low tracks (cyan and orange), surface frontal analysis at select times, and areas of significant snow, sleet, and freezing rain amounts from 16-17 February, 2015.