

**Central to Northeast U.S. Winter Storm
February 4-5, 2014
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Meteorological Overview:

One of the coldest Arctic air surges of the winter weather season was delivered following an early February winter storm which traversed the central Plains to New England. A strong, closed 500 hPa low glided southward along the California coast and advanced into the desert Southwest by the night of 3 February. The closed low weakened slightly as it moved toward the Plains and continued to do so throughout the storm's evolution. By the early morning hours of 4 February, the winter storm began to materialize over the southern and central Plains. A warm front formed along the Gulf Coast ahead of the incoming open 500 hPa low. As this storm moved eastward, a comma-head developed and delivered snow across Oklahoma, Kansas, and portions of Texas. Farther south in the transition zone, freezing rain and sleet impacted portions of the southern Plains, middle Mississippi Valley, and Tennessee Valley. The wintry precipitation began to spread into the Mississippi River Valley later that day as the upper level low continued its move northeastward towards New England.

By 5 February, the upper level low continued to weaken as it moved over the Great Lakes. The surface warm front along the Gulf Coast had transformed overnight into a cold front attached to a surface low that was along the Mid-Atlantic coast (fig. 3). This cold front extended from the Mid-Atlantic across the Southeast and into the Gulf of Mexico. As the strengthening surface low moved up the East Coast, snow fell west and north of it; it covered most of the Northeast and Upper Great Lakes throughout the day. Along with the snow, the transition zone to the south impacted the northern portions of the Mid-Atlantic with freezing rain and sleet. Snow continued to fall throughout the night of 5 February and into 6 February across New England. The snow began to taper off the morning of 6 February as the surface low moved east over the Atlantic Ocean.

Impacts:

Over a foot of snow fell across multiple states from the central Plains eastward towards the Northeast. Up to 7 inches of snow fell across the southern Plains and portions of the middle Mississippi Valley. Additionally, up to 15 inches of snow fell in Kansas (fig. 2)! The Ohio and Tennessee Valleys received 7-8 inches of snow. The majority of states across the Northeast received over a foot of snow with multiple areas reporting 12-15 inches in New York. In fact, states such as Kansas and New York had such an impact from the winter precipitation that they declared states of emergency. The state of Pennsylvania had over 600,000 people without power; this was the second largest power outage following Hurricane Sandy. Traveling was also treacherous; many wrecks occurred over these states and flight cancellations for this winter storm totaled to over 3,000. Behind this front, 1040 hPa Arctic high pressure crossed the Plains and moved over the East Coast. This brought record breaking low temperatures which created a dangerous combination for people without power during the frigid conditions.

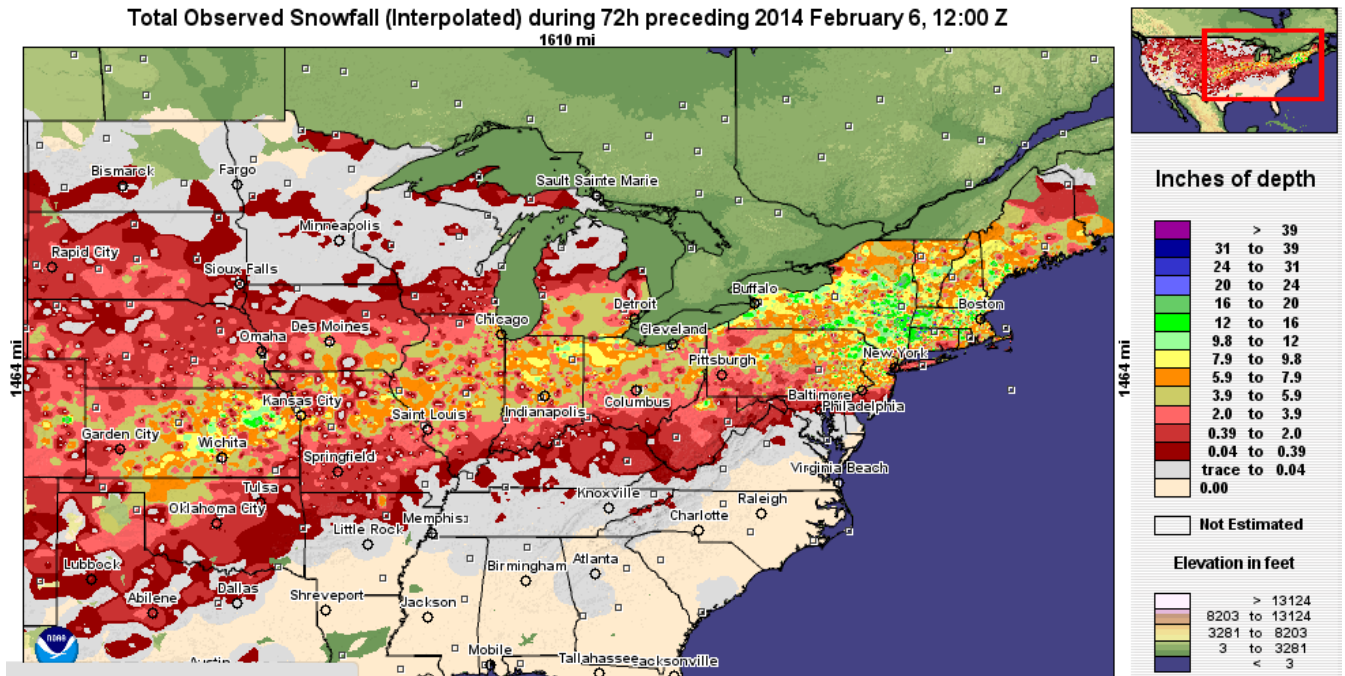


Figure 1: Map showing snowfall amounts over a 72 hour period from February 4-6 (NOHRSC).

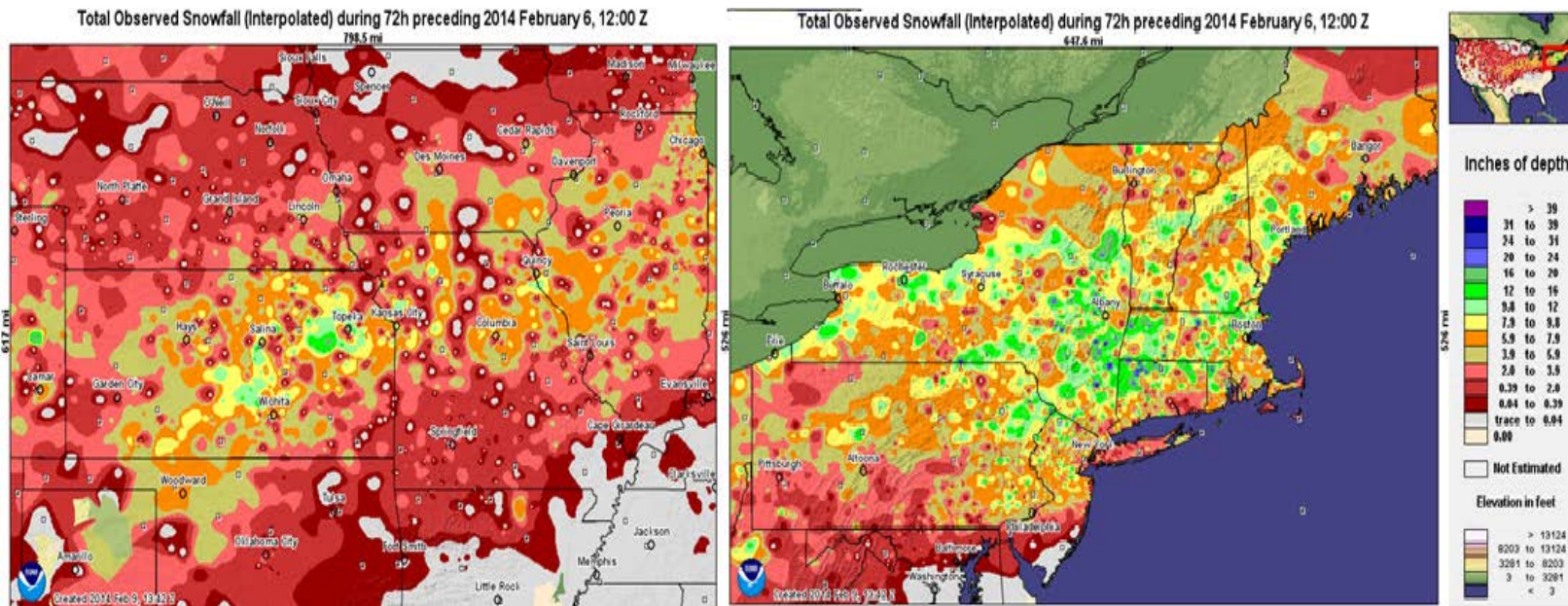


Figure 2: Map focused in on areas that were impacted from the heaviest amounts of snow; Note Kansas (left) and New York (right) (NOHRSC).

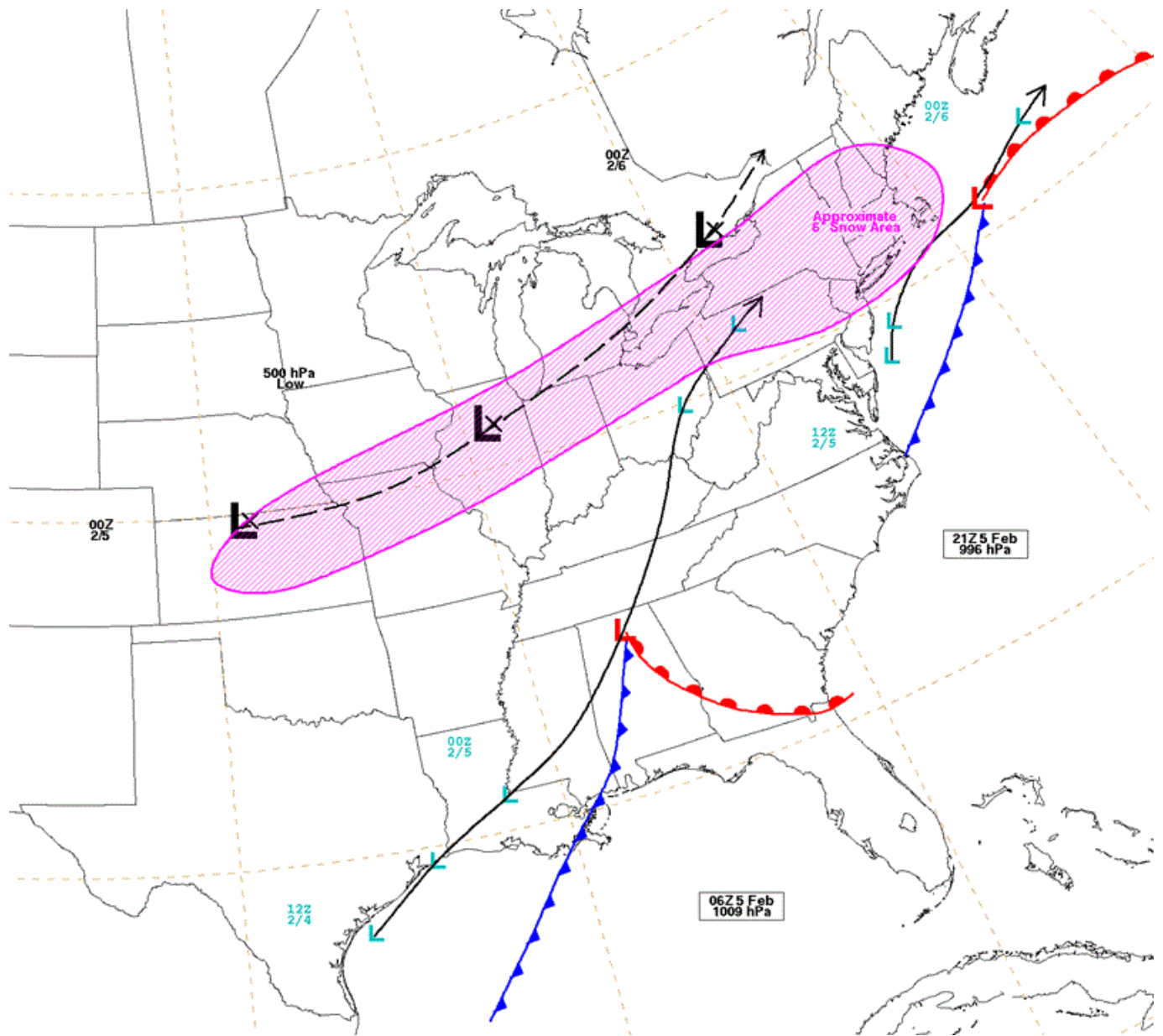


Figure 3: 500 hPa low (black L) track, surface low (blue) track, area of snow (magenta), and the surface front at its most intense point.



Figure 4: Picture of a downed tree in Philadelphia on February 5th (CNN).