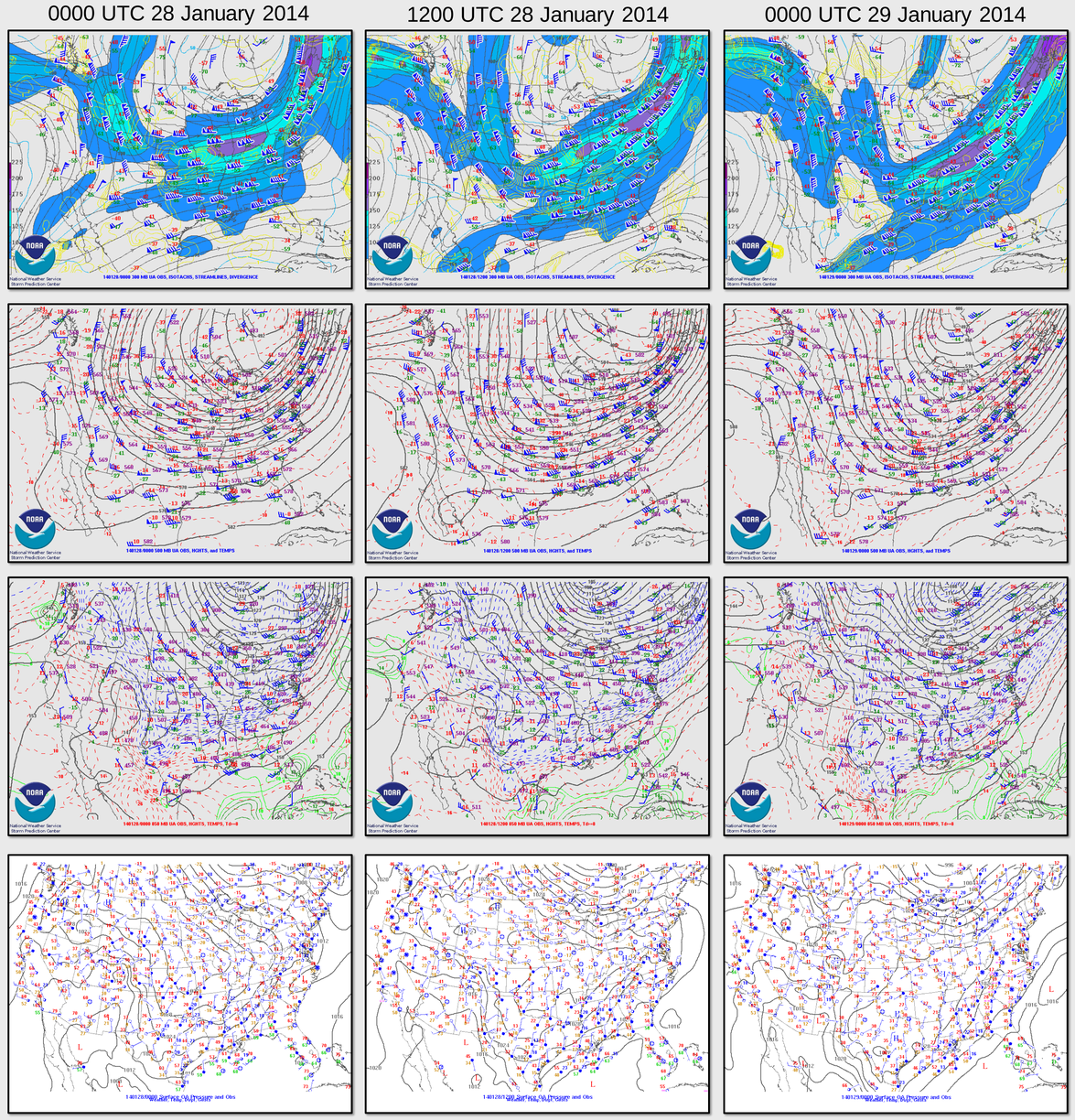
Meteorological Overview of the 28 January 2014 Southeast Winter Storm

Trisha D. Palmer[1], S. Hunter Coleman[2], Patrick D. Moore[3], Adam K. Baker[1], Jason T. Deese[1], Jessica L. Fieux[1], Steven E. Nelson[1], and Keith M. Stellman[1]

[1]National Weather Service Atlanta Forecast Office, Peachtree City, GA
[2]National Weather Service Forecast Office, Columbia, SC
[3]National Weather Service Greenville-Spartanburg Forecast Office, Greer, SC

Synoptic Overview



Aloft

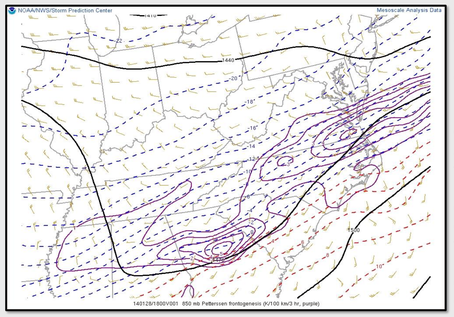
- Broad upper trough across eastern third of the country
- Upper divergence associated with the right entrance region of a jet streak
- Series of embedded shortwaves (90 knot wind maxima) contributed to deepening of mean upper trough

Surface

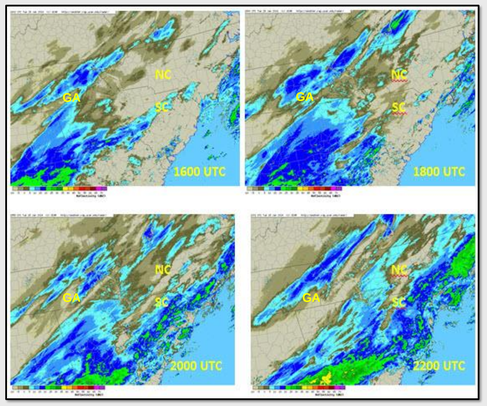
- Arctic airmass plunged southeast from the northern Plains
- Cold front moved across the Appalachian Mountains late on 27 January
- Temperatures dropped approximately 30ºF in a 12-hour period behind the front
- Temperatures continued to fall after onset of snow

Precipitation

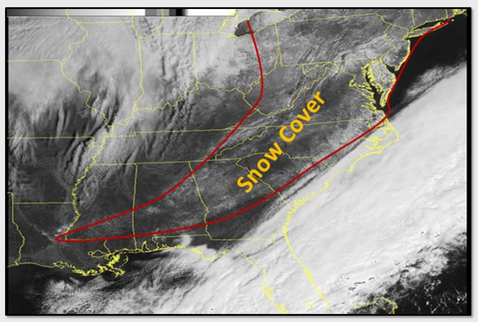
- Area of frontogenetically forced upward motion produced precipitation across north Georgia early on 28 January, spreading eastward through the day
- Interaction of mid- and upper-level wind maxima and frontogenetical forcing produced a southwest-to-northeast band of upward motion and precipitation
- Precipitation moistened the dry atmosphere; snow began across Georgia and spread into the Carolinas



SPC objective analysis of 850 mb geopotential height (m; black contours), temperature (dashed blue, 0°C or lower; dashed red, above 0°C), wind (kt; barbs), and Petterssen frontogenesis (K per 100 km per 3 hr; purple contours), height (black contours), and temperature (dashed blue and dashed red contours) at 1800 UTC on 28 January 2014.



Regional mosaic of composite radar reflectivity at (a) 1600 UTC, (b) 1800 UTC, (c) 2000 UTC, and (d) 2200 UTC on 28 January 2014. Source: UCAR/NCAR



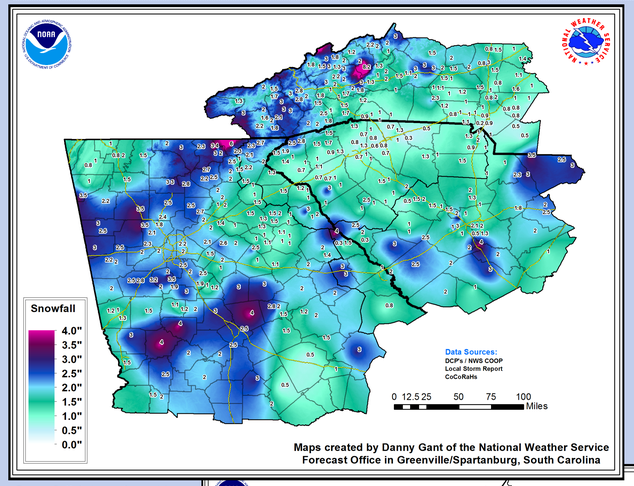
Visible satellite imagery from 1515 UTC 30 January 2014, showing areal extent of snow cover across the Southeast and Mid-Atlantic

Climatological Reference

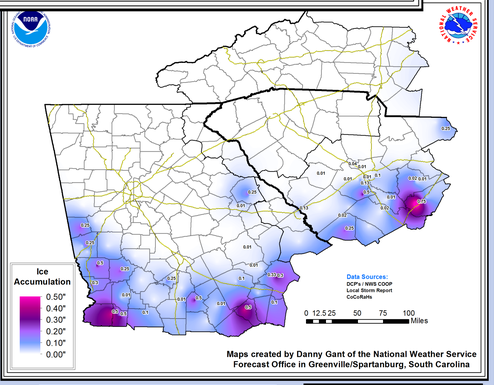
- Onset of snow with temperatures < 30ºF *extremely* rare in the Southeast
  - In Atlanta, it has only happened once in the past 30 years!

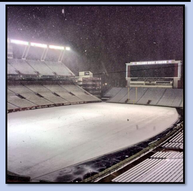
Accumulation and Impacts

- Widespread amounts of 1-2 inches of relatively dry snow
- Lower troposphere remained below freezing through the event, but road surfaces were initially still warm
- Initial snowfall melted on impact and subsequently re-froze
  - Frictional effects of tires on roads likely contributed to additional ice development
- Formation of thin layer of ice on streets and highways led to dangerous conditions
- Metro Atlanta was especially hard-hit; motorists stranded on roadways for hours and in some cases overnight



Snowfall (above) and ice (right) accumulation from the 28 January 2014 storm (courtesy Danny Gant, WFO GSP)





Images from the 28 January winter storm. Top left: Gridlock in Metro Atlanta (courtesy AJC). Middle (left to right): Columbia Statehouse (courtesy Gerry Melendez), WFO Greenville-Spartanburg, Williams Brice Stadium (courtesy Ryan Fischer). Bottom left: Atlanta Journal-Constitution headline from 29 January (courtesy AJC).

Contact: Name: Trisha D. Palmer
Organization: NOAA/NWS Peachtree City
Email: trisha.palmer@noaa.gov