

Southern Appalachians Winter Storm – 6-7 March, 2014

By: Mary Beth Gerhardt, WPC meteorologist

Meteorological Overview:

An early March winter storm produced snow across the southern Appalachians and brought a mix of snow, sleet, and freezing rain to the lower elevations of the adjacent Piedmont region. An amplifying 500 hPa shortwave trough exiting the southern plains Wednesday night, 5 March, initiated the event as it closed off over the southern tier of the nation and helped spin up a surface low in the northern Gulf of Mexico on Thursday, 6 March (Fig. 1-2). The surface low tracked northeastward toward the Big Bend of Florida before redeveloping and rapidly deepening off the Carolina coastline Thursday night into Friday morning, 6-7 March (Fig. 1). Low level southerly flow from the Gulf of Mexico and easterly flow off the Atlantic Ocean fueled a wide axis of moderate to heavy precipitation in an area of overrunning to the north of a frontal boundary initially stretched across northern Florida and within a deformation zone that set up to the northwest of the strengthening coastal low.

The majority of precipitation fell as rain. However, Arctic air wedged in place east of the Appalachians was slow to erode during the event and allowed for snow within the northwestern fringe of the precipitation shield. A narrow swath of 4 to 6 inch snowfall totals, with isolated amounts of up to 15 inches, was reported from western North Carolina into south central Virginia (Fig 3). The easterly fetch off the Atlantic nosed in a layer of warm air aloft and changed snow over to sleet and freezing rain in locations southeast of the heavy snow axis. Several cities across North Carolina and Virginia reported ice accumulations of 0.25 inches or greater (Table 1).

The coastal low deepened to 995 hPa by 00 UTC on 8 March, and then began to track northeastward away from the coastline as the initiating 500 hPa shortwave trough slid eastward out into the Atlantic (Fig. 1). This ended precipitation from west to east along the Eastern Seaboard by late Friday night, 7 March.

Impacts:

The early March storm closed schools, shut down roads, and caused multiple traffic incidents from western North Carolina into central Virginia. Flight delays were reported at Piedmont Triad International Airport and ice accumulations brought trees down across the campus grounds of Elon University. The ice also knocked down power lines, leaving hundreds of thousands without power. In the higher elevations of the southern Appalachians, several ski resorts benefitted from the storm and were able to advertise fresh powder for the upcoming ski weekend.

Images:

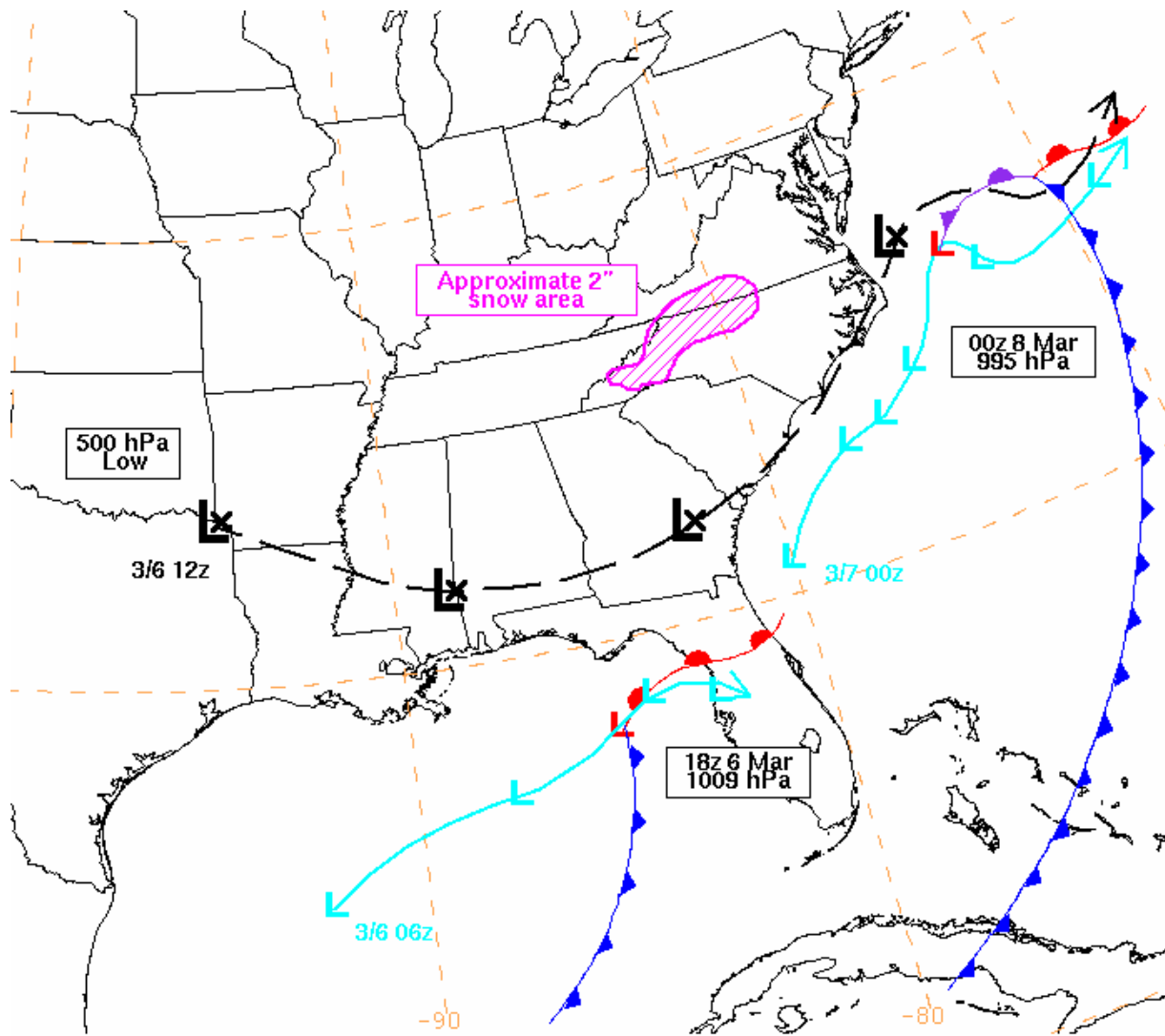


Figure 1: Summary of the Southern Appalachians winter storm (6-7 March, 2014) depicting the 500 hPa low track at every 12 hours (dashed black), the surface low tracks at every 6 hours (cyan), approximate area of greater than 2 inches of snow (magenta), and select surface analyses during the storm (18 UTC 6 March, 2014 and 00 UTC 8 March, 2014).

500 mb Heights (dm) / Abs. Vorticity ($\times 10^5 \text{ s}^{-1}$)

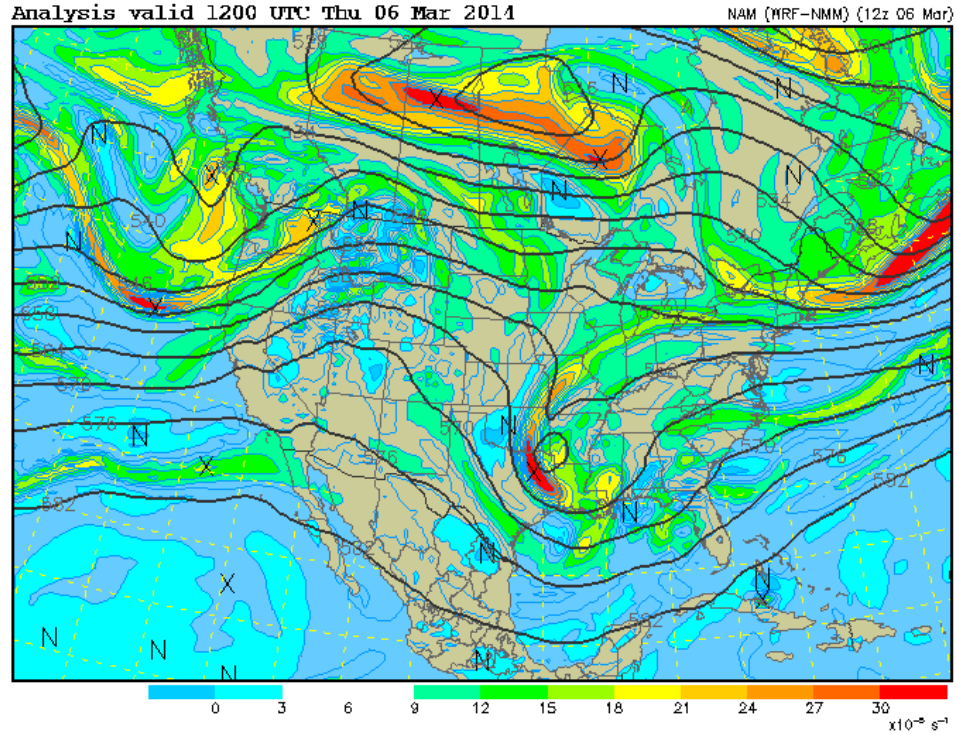


Figure 2: 500 hPa heights (dm) and absolute vorticity from 12 UTC 6 March, 2014 (image courtesy of UCAR).

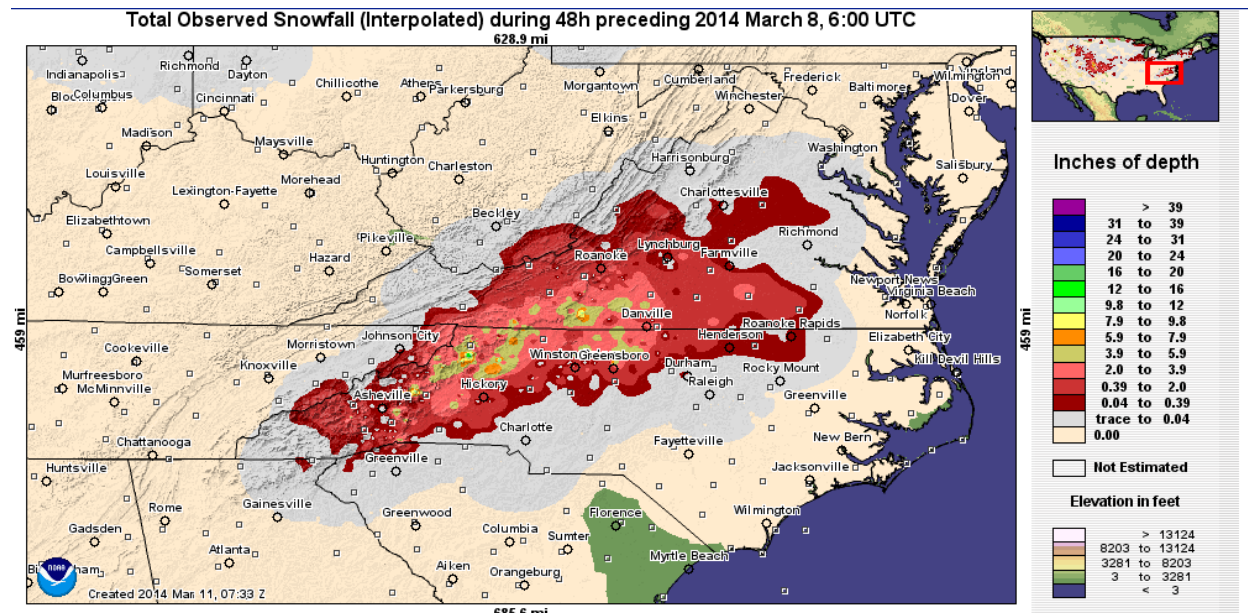


Figure 3: Snowfall analysis for 48 hours preceding 6 UTC 8 March, 2014 (image provided by NOHRSC).

City, State	Freezing Rain (inches)
Asheboro, NC	0.50
Burlington, NC	0.50
Lexington, NC	0.50
Welcome, NC	0.50
Elon College, NC	0.40
Winston-Salem, NC	0.40
Hillsborough, NC	0.30
Bahama, NC	0.25
Greensboro, NC	0.25
Henderson, NC	0.25
Randleman, NC	0.25
South Boston, VA	0.25
Thomasville, NC	0.25
Virgilina, VA	0.25

Table 1: Select freezing rain reports from the event (*observations courtesy of WPC*).