

## **Early Season Nor'Easter – November 6-7, 2012**

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**Meteorological Overview:** This strong early November winter storm ravaged areas of the coastal Northeast U.S. which only a week earlier dealt with the destructive impacts from Hurricane Sandy and its extratropical transition. The pattern aloft during this period featured an anomalous ridge across the Central Great Basin/Desert Southwest which favored negative heights over the eastern states. A split flow regime was in place with an active southern branch of the jet carrying shortwave energy from the Lower Mississippi Valley to the Southeastern U.S. coast on 06 November 2012. This impulse would eventually turn northward in response to downstream ridging where the system gained a negative tilt across the coastal Carolinas between 06-12Z on 07 November 2012 (Figure 1). During the following 12 hours, this intensifying disturbance would begin interacting with a northern stream shortwave (seen over the Lower OH Valley in Figure 1) which led to further deepening of the surface low as it neared the 40°N/70°W benchmark (Figure 2 a,b). Further support for intensification existed as a 300-mb jet streak tracked offshore of the Carolina coast placing the coastal Mid-Atlantic in the favorable left-exit region of the jet. As the low-level circulation continued gathering strength on its approach northward on the morning of the 7<sup>th</sup>, the 850-mb moisture transport dramatically picked up strength offshore of Southern New England between 16Z-21Z on 07 November. This region was collocated within an enhanced region of 850-mb frontogenetic forcing with observations supporting a 14°C (~25°F) across the boundary. At the western fringe of this strong baroclinic zone was an area of weakly negative equivalent potential vorticity (EPV) within the 800-750-mb layer. In the presence of a saturated lower-to-mid troposphere, the diminished EPV values resulted in considerable conditional symmetric instability (CSI) across the coastal Northeastern U.S.

During this particular timeframe, much of the moderate to heavy snowfall commenced from Southern NJ up to Eastern MA (Figure 3). A pair of embedded heavier amounts of up to 13.5” of snow were located across Central NJ and South-Central CT where mesoscale banding was observed. During this particular event, snow was the dominant hydrometeor type given the further offshore low track. This in conjunction with a surface ridge that set up across Central Quebec allowed modified Arctic air to advect into the Northeastern U.S. Additionally, the tightening pressure gradient over the region (particularly during the 18-00Z 07/08 November timeframe) led to strong wind gusts along coastal New England. Local wind observations suggested gusts up to 76-mph over Buzzards Bay, MA during the height of the event, while 55-65 mph reports were more commonplace elsewhere in the region.

**Impacts:** As this region of the U.S. had just dealt with the wrath of Hurricane Sandy only a week previous, it did not take much damage to further impact local infrastructure. The combination of heavy precipitation, near hurricane force wind gusts, and high seas in excess of 8-ft at local beaches led to over 375,000 additional power outages across NJ, NY, and CT. By 9 AM EST 08 November, reports suggested up to 715,000 homes and businesses over the Northeast were without power due to the combined impacts from these menacing storms. Further, nearly 2,000 flights were cancelled from local airports which also included a number of park and coastal road closures. Despite some mandatory evacuations, four lives were lost during this event.

