**Late Season Mid-Atlantic and Northeast Winter Storm**
**22-24 April, 2012**
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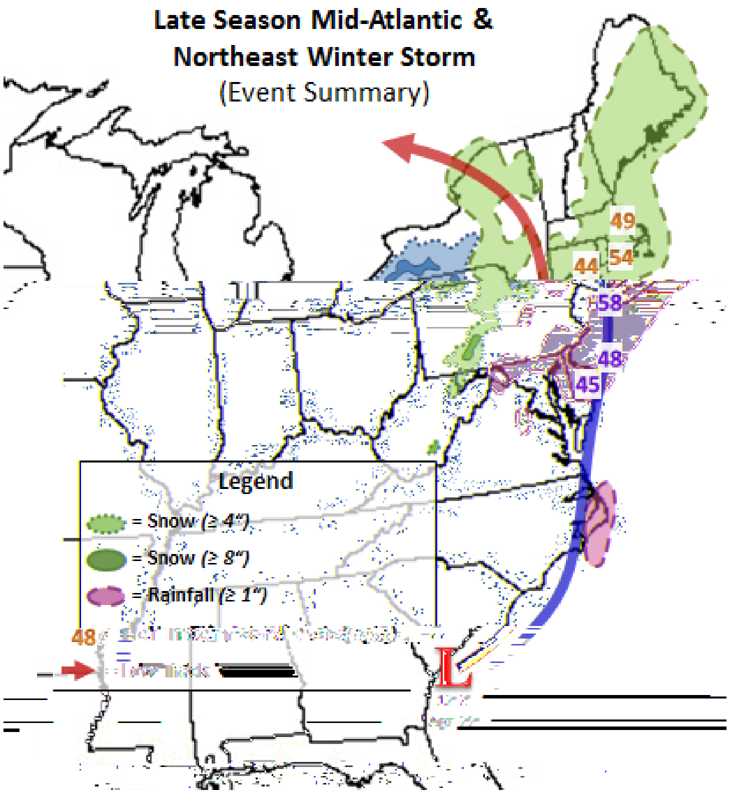
**<u>Event Overview/Impacts</u>:** A coastal storm tracked up the Eastern Seaboard April 22-24th, 2012, bringing heavy rains, gusty winds, and late-season snows to a large portion of the Northeast and Mid-Atlantic states. Coastal regions from North Carolina to Maine reported widespread rainfall totals in excess of one inch from the event, and isolated reports approaching five inches were observed across New England (Fig. 1). New Boston, New Hampshire exceeded five inches of rain, with 5.74 inches reported. The rain was a welcome relief to the recent dry conditions across the region, but it also made for traveling woes throughout heavily populated cities along the I-95 corridor. Travel conditions were particularly hazardous near the New England coast, where steady rains combined with wind gusts of 40-50 mph (Fig. 1a). Farther inland, the late-season storm blanketed much of the central Appalachians with over four inches of snow (Fig. 1a). A few sites over Western New York and Central Pennsylvania received over a foot of snow, and one location, Laurel Summit, PA, measured 23.7 inches of snowfall (Fig 1b). Although snowfall reports from this storm do not exactly stand out in comparison to other major coastal storms that have impacted the region, the late-April timing of the event certainly made it memorable. The storm came on the heels of a record breaking warm March and early spring across the Mid-Atlantic and Northeast. Thousands of power outages were reported due to heavy wet snow falling on leafy tree branches. This event also made for an interesting end to the 2011-2012 winter weather season across the eastern U.S., which now started and ended with big anomalous coastal events (see event review for "Historic Autumn Mid-Atlantic to Northeast U.S. Winter Storm").

**<u>Meteorological Overview</u>:** Several key ingredients came together and created a classic setup for this late-season coastal storm. Shortwave energy dug into the Ohio and Tennessee Valleys Saturday night (00-12 UTC 22 April), while a southern stream shortwave moved eastward through the northern Gulf of Mexico (Fig. 2a). A cutoff low formed over the Ohio and Tennessee Valleys, and the southern stream energy slowly weakened while lifting east-northeastward. These two systems, combined with divergence aloft from the right entrance region of an upper jet and a sharp baroclinic zone set up along the Eastern seaboard, allowed a surface low to rapidly strengthen while tracking up the Carolina coast Sunday morning (12 UTC 22 April) (Fig. 3a). As the low deepened and tracked northward just off the Mid-Atlantic coast on Sunday (22 April), an expansive area of precipitation developed from North Carolina to Maine. Strong warm air advection and northerly moisture flux ahead of the storm fueled bands of moderate to heavy rains along the coast. The storm continued to track due north up the eastern seaboard Sunday night, and by Monday morning (12 UTC 23 April), a 986 hPa surface low was analyzed near New York City (Fig. 3b). While the deep surface low along the coast brought gusty winds and drenching rains to the coastal regions, the amplifying shortwave energy that closed off a low over the Ohio Valley led to a secondary area of heavy precipitation farther inland (Fig. 2b). The highest amounts were observed within the comma head that set up across northeastern Pennsylvania and central New York. Northeasterly flow behind the storm filtered in enough cold air to support snow over the higher elevations of the central Appalachians Monday morning (12 UTC 23 April), but the strong April sun caused many locations to change back over to rain by Monday afternoon. The surface low along the coast took a northwestward turn and started to slowly weaken while tracking inland over New York State on Monday (23 April). By Tuesday evening (00 UTC 24 April), the storm had moved well into Quebec, and the strong winds and heavy precipitation over the Northeast and Mid-Atlantic states had diminished.

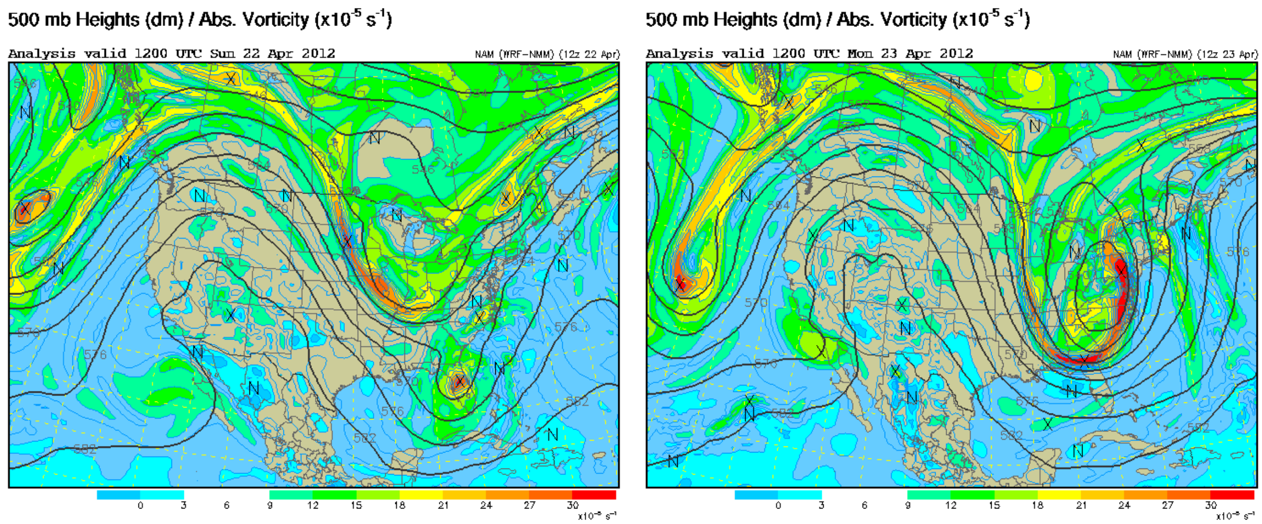



a.

| Select Storm Snowfall Totals (inches) | |
| --- | --- |
| Laurel Summit, PA | 23.7 |
| Sinclairville, NY | 15.0 |
| Sylvania, PA | 14.0 |
| Cattaraugus, NY | 12.8 |
| Colden, NY | 12.6 |
| Warsaw, NY | 12.0 |
| **Select Storm Rainfall Totals (inches)** | |
| New Boston, NH | 5.74 |
| Madison, NJ | 4.90 |
| North Windham, ME | 4.84 |
| Saco, ME | 4.79 |
| Farmington, ME | 4.75 |
| Oxford Township, NJ | 4.75 |

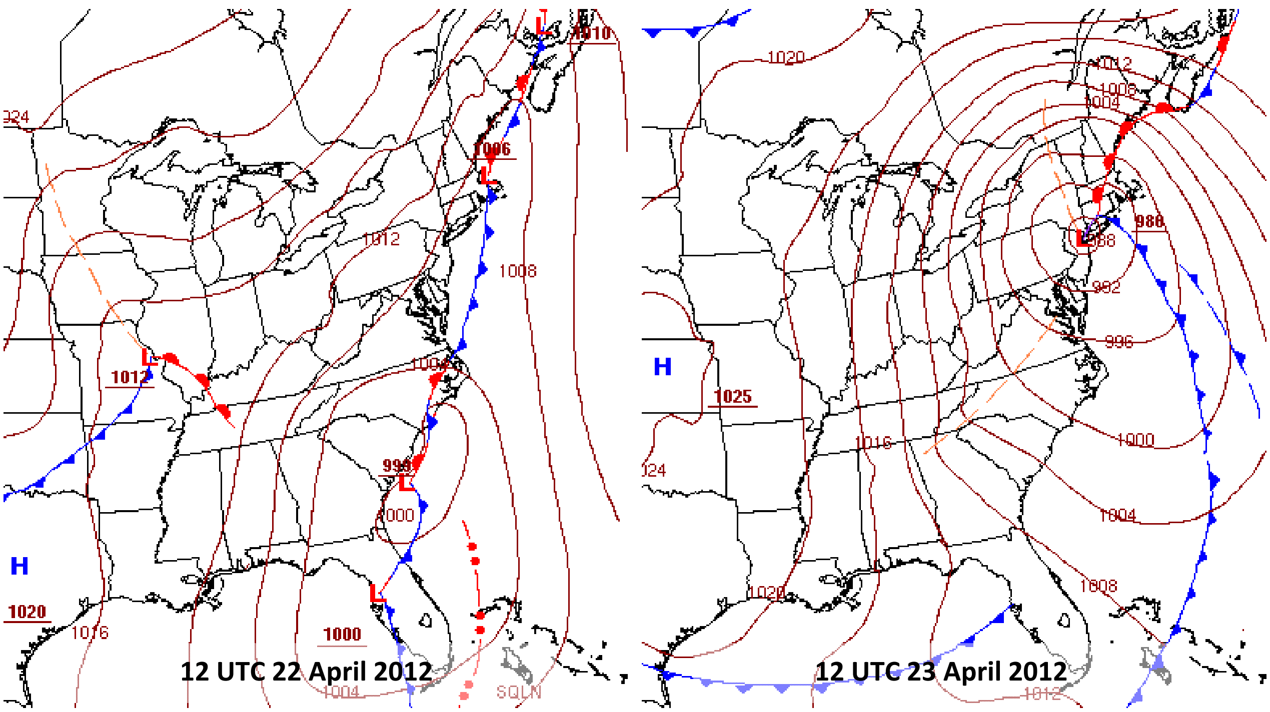
b.

Figure 1: (a) Summary of event and (b) select storm snowfall and rainfall totals *(Data provided from HPC Storm Summaries, NOHRSC, and NMQ).*




a. b.

Figure 2: 500 hPa heights (dm) and absolute vorticity from (a) 12 UTC on the 22nd and (b) 12 UTC on the 23rd of April 2012 *(Images provided by UCAR)*.




a. b.

Figure 3: Analyzed surface pressures (isobars every 4 mb) and fronts at (a) 12 UTC on the 22nd and (b) 12 UTC on the 23rd of April 2012 *(Images provided by HPC).*