Upper Midwest To New England Winter Storm – February 28 – March 1, 2012
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Meteorological Overview:

A significant winter storm impacted the north central to northeastern U.S. from 28 February to 1 March, 2012, producing heavy snow and blizzard conditions along with minor to locally moderate accumulations of sleet and freezing rain. The winter storm ended up being one of the biggest storms of the 2011 to 2012 winter season for the north central U.S. and occurred toward the end of what had been a very quiet winter season for the region up until that point. In fact, much of the region was experiencing a moderate to severe drought at the time, but the storm managed to put a dent in the precipitation deficit. Central Minnesota into northern Wisconsin were hit hardest in the Upper Midwest with snowfall totals topping out at 20 inches (both at Clam Lake, WI and Hinckley, MN as seen in Table 1). The Northeast also experienced a significant snow storm with storm total snowfall around a foot in many locations from central New York into central New England (Figure 1). The warmer side of this storm system was responsible for hundreds of severe weather reports, stretching from the Central Plains into the Central Appalachians.

The storm originated from the central Rockies in the form of several disorganized areas of low pressure which consolidated into a single low pressure center during the evening of 28 February. Snow began to overspread the Upper Midwest late from late on the 28th into the 29th. The surface low subsequently continued to deepen on 29 February as it tracked into Minnesota, reaching a peak intensity of 986 mb that morning (Figure 2), while generating winds of 50 – 60 mph from portions of the Central Plains into the Upper Mississippi Valley. At the same time to the east, light to moderate snow developed out ahead of a warm front into portions of the Northeast, with snowfall intensity tapering off overnight. By the morning of 1 March, moderate snow began to develop again as the main surface low from the Upper Midwest approached, and a secondary low off developed off of the New England coast.

Synoptically, the storm developed as a strong mid to upper level trough entered the western U.S. on 28 February. The trough translated eastward, acquiring a negative tilt on 00 UTC 29 February, and closed off a mid level center by 12 UTC on the 29th over the central High Plains. Jet level winds on the lee side of the upper trough were in the 100 to 150 kt range which helped to enhance vertical motion within the left exit region of the strong upper jet and a region of upper level difluence, both directly over the regions which experienced the heaviest snow. The upper trough weakened as it reached the Northeast on 1 March, partially explaining why the impacts on the Northeast were less intense than observed over the Upper Midwest.

Impacts:

The winter weather impacts from this storm were greatest across the Upper Midwest with blizzard conditions causing widespread power outages and road closures, along with the closure of numerous schools and businesses. Snowfall rates reached 1 to 2 inches per hour within some of the heavier snow bands from portions of eastern South Dakota through central Minnesota and into northern Wisconsin. State officials closed Interstates 29 and 90 at one point during the storm due to the hazardous travel conditions. State troopers reported hundreds of accidents on state highways, with dozens of injuries and one fatality in Wisconsin, occurring as a vehicle veered into oncoming traffic on icy roads. As less snow fell across the Northeast, the impacts on school and business closures were reduced, but there were many accidents attributed to blowing snow and icy roads with three fatalaties reported in Pennsylvania. In addition to winter weather impacts, hundreds of severe weather reports included roughly 50 tornadoes and over 50 fatalities from the central Plains into the central Appalachians.

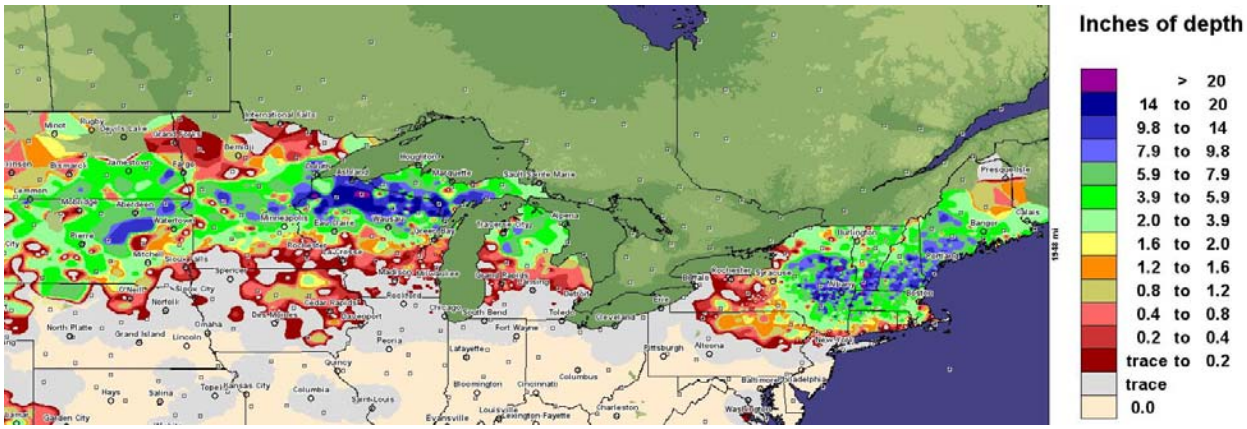

Figure 1: Storm total snowfall from 00Z Feb. 28 – Mar 2 (http://www.nohrsc.noaa.gov)

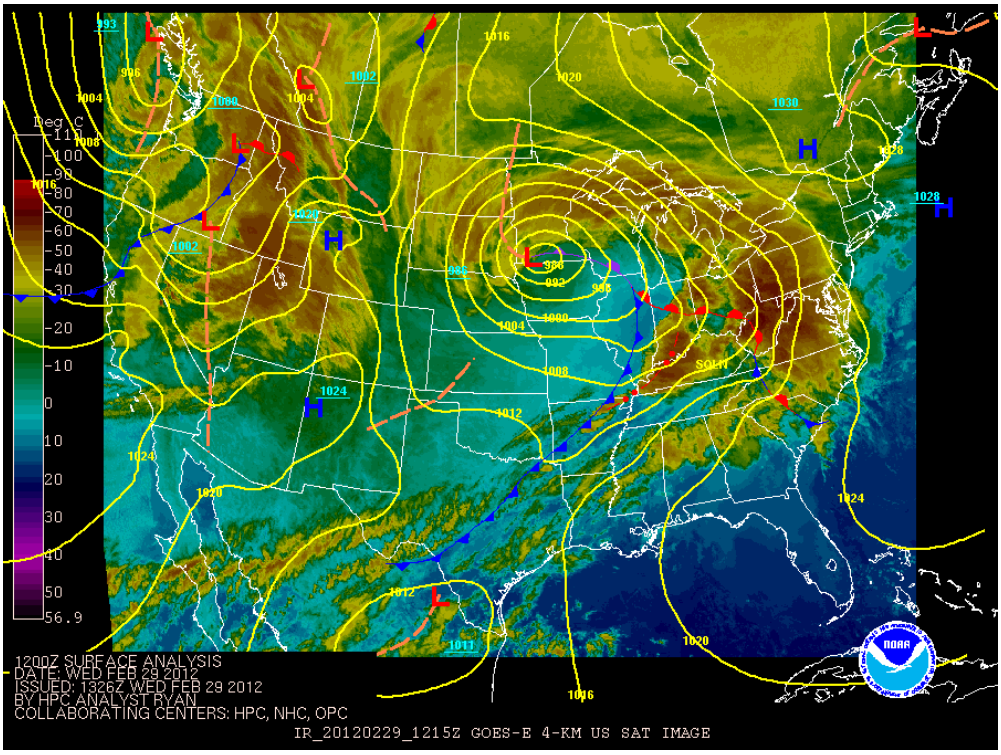

Figure 2: HPC surface analysis / IR satellite composite near peak intensity, valid 12Z on Feb. 29, 2012 (www.hpc.ncep.noaa.gov)

Selected Storm Total Snow Accumulation (in)			Selected Wind Gusts (mph)	
4 W Clam Lake, WI	20.0		Mackinaw City, MI	55
18 E Hinckley, MN	20.0		Calhoun, MI	54
6 N Iron Mountain, MI	16.0		Grand Island, NE	54
Landgrove, VT	14.5		Duluth, MN	51
16 NW Gann Valley, SD	14.0		Union Center, SD	51
Troy, NY	10.5		Kalamazoo, MI	47
Worcester, MA	6.5			

Table 1: Select snow and wind gust information from the storm (source: HPC storm summary)