Upper Midwest/Mid-Atlantic/Northeast Snow Storm
5-8 March, 2013
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Meteorological Overview: A late season winter storm developed over the Upper Midwest on the morning of March 5th that eventually traveled to the East Coast by the 7th. The storm originated from an eastern Pacific shortwave that traveled across British Columbia and then tracked into the Northern Plains. Around the same time as the surface low was producing wintry precipitation over the Upper Midwest, lee cyclogenesis led to the development of a southern stream low that tracked from the Central Plains and eventually merged with the northern stream disturbance. As a result, a strong coastal low developed near the Virginia coast, and tracked slowly out to sea (Figs. 1 and 3). However, the northern edge of the storm affected eastern parts of New England.

This storm proved difficult to forecast along the East Coast for a few reasons. Along the Interstate 95 corridor, boundary layer temperatures proved to be the greatest factor in the amount of snow that fell. Model forecasts depicted 850mb and 925mb temperatures cold enough for snow in these areas, but they had difficulty resolving the warmer marine layer temperatures below 925mb from the Atlantic Ocean. Similar precipitation type forecasting concerns arose in coastal areas of New England as milder air from the Atlantic battled the limited amount of cold air already in place. Another forecast problem for the Northeast U.S. was the strength of the downstream ridging and the ultimate track of the surface low. Most model guidance forecasted a more eastward track,farther away from New England owing to a stronger-than-expected ridge. These forecasts did not verify, as the ridge was weaker and allowed the storm to track farther north.

Event Overview/Impacts: This winter storm had a significant impact on much of the Midwest, Ohio Valley, Mid-Atlantic, and eastern New England. There were numerous reports of at least 12 inches of snow in northwestern Virginia, with some in excess of 20 inches. Another area of very heavy snow occurred over eastern Massachusetts, where amounts on the order of 2 feet were observed (Fig. 2). Most of this snow was heavy and wet with low snow-to-liquid ratios, and the weight of this snow was enough to damage trees and power lines, resulting in numerous power outages. Along the coast of Maine and Massachusetts, beach erosion from the strong onshore winds and high waves was enough to destroy and damage many waterfront houses.

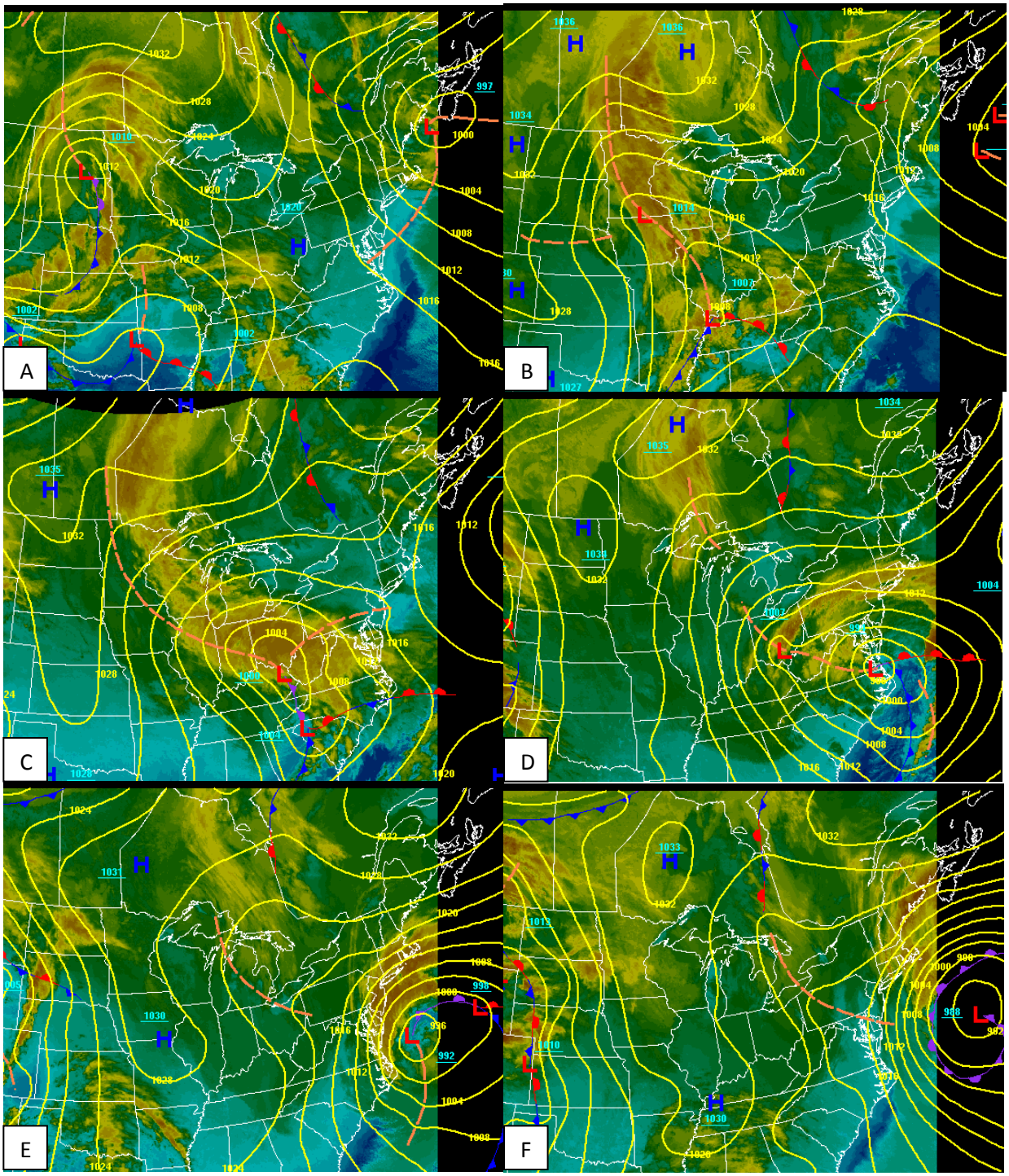

Figure 1. Surface analyses with overlaid infrared satellite imagery at 12-hour intervals over the course of the storm.

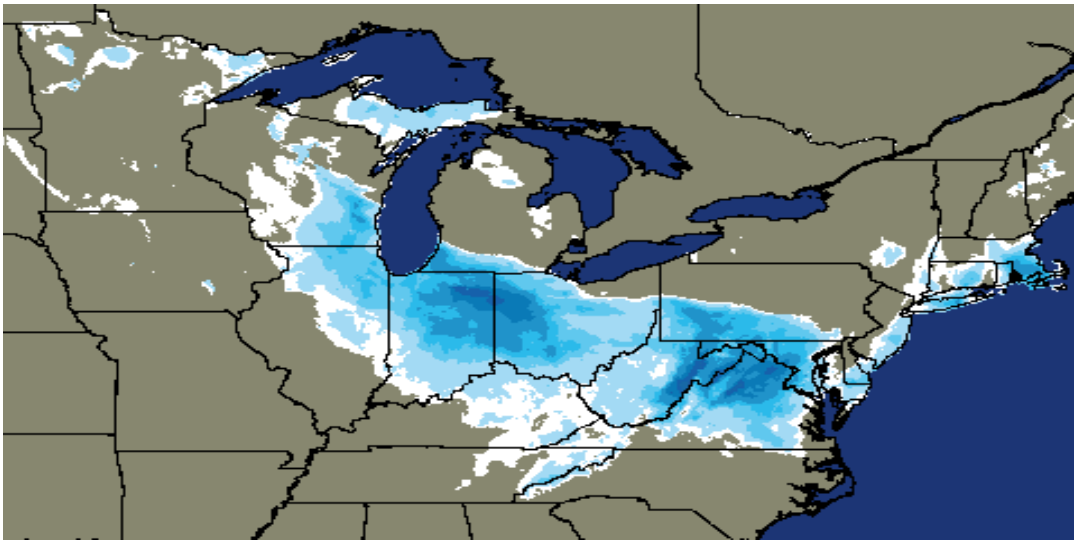

Figure 2. Total snowfall amounts from this winter storm, with the darkest blue colors denoting the heaviest snowfall totals.

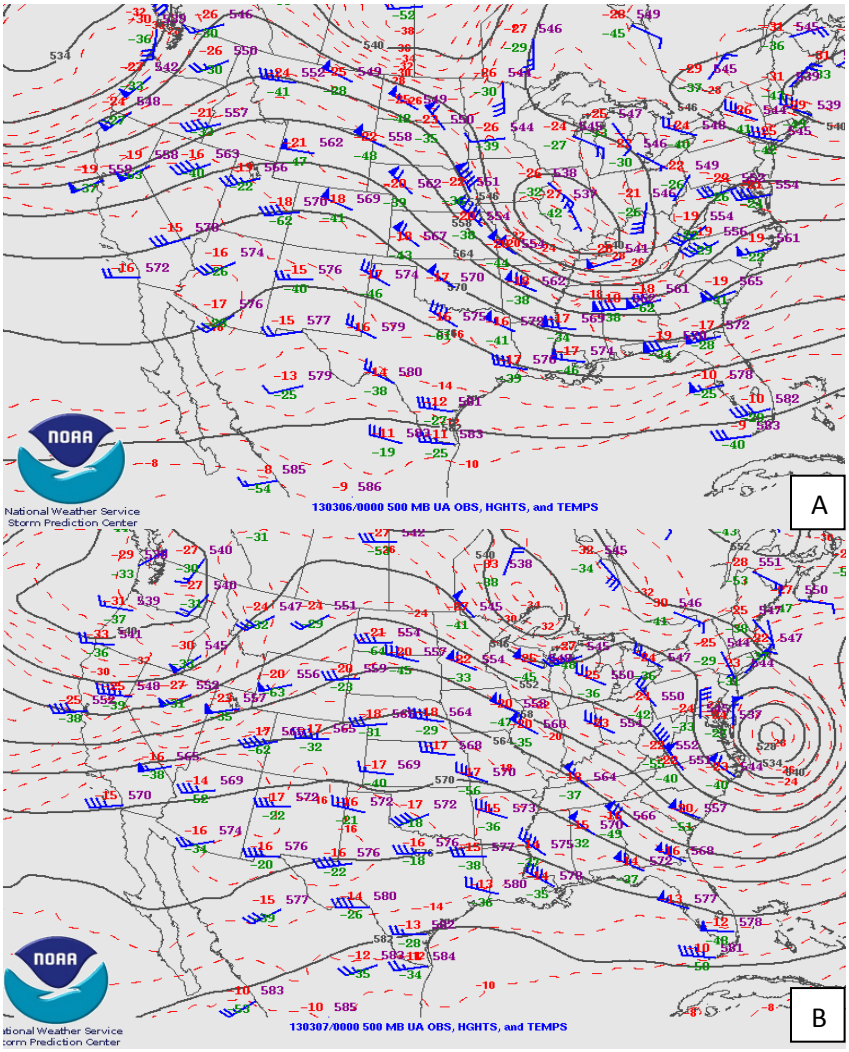

Figure 3. 500mb height pattern along with plotted upper air observations, with A) at 00Z on 6 March 2013, and B) at 00Z on 7 March 2013, as provided by the Storm Prediction Center.