

**Midwest to Northeast U.S. Winter Storm
12-13 March, 2014
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Meteorological Overview:

A fast-moving winter storm brought a swath of significant snowfall from the Midwest eastward through the lower Great Lakes and across northern New England during the second week of March 2014 (fig. 1 and 2). The storm was a consequence of baroclinic development as a progressive upper-level trough from the Pacific merged with a shortwave trough dropping southeastward from central Canada. The surface low pressure center of the storm can be tracked back to the foothills in northern Wyoming on 10 March when the Pacific upper trough began to move off the Rockies into the High Plains (fig. 1). At this time, the upper-level shortwave trough was beginning to head southward from central Canada but was still quite far away from the surface low center. With a lack of upper-level support, the surface low deepened very slowly along a nearly stationary front while moving east-southeastward across the central plains. By 11 March, the shortwave trough and the associated cold air mass was moving into the Upper Midwest and approached the low pressure system in the central plains (fig. 3a, b). As the two systems merged over the Midwest early on 12 March, a new low pressure center formed near the Illinois-Indiana border and began to intensify rapidly under a favorable baroclinic environment (fig. 3c, d). Precipitation with embedded thunderstorms formed north of the surface low and became heavy at times as the coverage expanded rapidly to the east-northeast into the lower Great Lakes and New England during the day on 12 March (fig. 3d, f). Temperatures were above freezing immediately north of the track of the low while heavy snow fell farther to the north. By early in the evening, the storm center had already reached New York City and continued to move rapidly to the east and intensified further (fig. 3f). At this point, snow in western New England had begun to decrease in intensity. The storm reached peak intensity early on 13 March as the center moved across Gulf of Maine towards Nova Scotia and began moving away from New England. As a result, snow began slowly tapering off in northern New England throughout the day and ended by evening.

Impacts:

This storm brought a quick deposit of new snow across a wide area from the Midwest through interior New England. Southerly flow ahead of the strengthening storm brought mild air from the Atlantic and kept the precipitation as rain across coastal Maine, southern New England, and into much of Pennsylvania. Four to six inches of snow fell primarily from Chicago, Illinois eastward across lower Michigan, northern Indiana and northern Ohio, increasing to over a foot in western New York, and to locally over two feet in parts of the Adirondacks and northern New England. The storm prompted blizzard warnings for western New York where the intensity of the snow was likely enhanced by nearby Lake Ontario. In addition, gale force winds during and immediately behind the storm created blowing snow and low chill values across the region. Local schools and businesses were closed and transportation was halted. Flights were cancelled at nearby airports. Parts of the New York Thruway was also closed. Wind gusts of higher than 60 mph were recorded in the central Appalachians and into the Mid-Atlantic due to the rapidly intensifying storm. No known deaths or injuries were directly attributed to the storm in the United States. However, the heavy snow resulted in a deadly traffic accident in nearby southern Ontario, Canada, bringing traffic to a standstill. Further details about this event are available from Storm Summaries issued by the Weather Prediction Center.

http://www.wpc.ncep.noaa.gov/winter_storm_summaries/storm13/storm13_archive.shtml

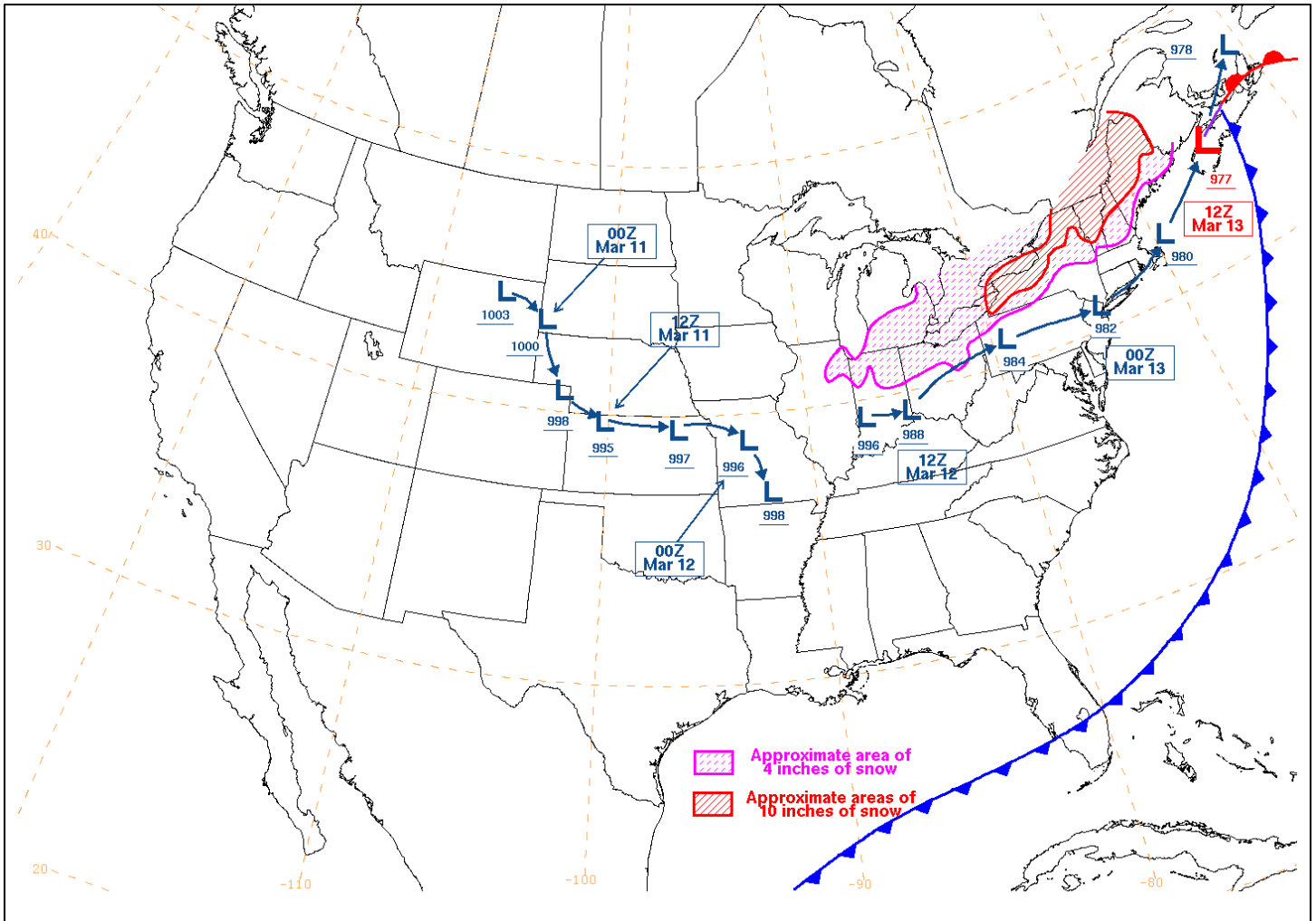


Fig. 1—An overview map of the storm showing the tracks and sea-level pressure values of two main surface low pressure centers. The approximate area of four or more inches of snow and the WPC frontal analysis at 12Z on 13 March, 2014 are also shown.

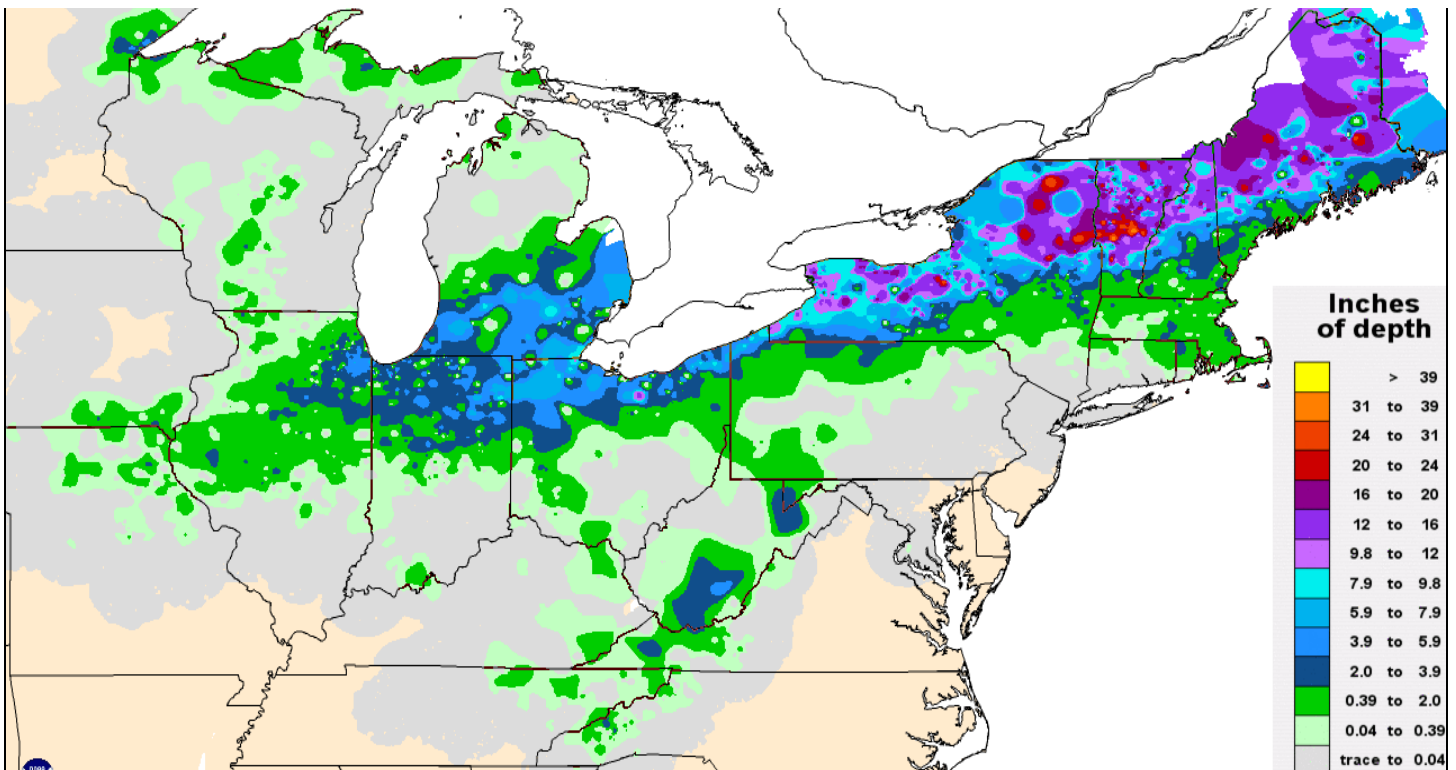


Fig. 2—A map of observed snowfall reports for the 72 hours preceding 12Z on 14 March, 2014 (NOHRSC).

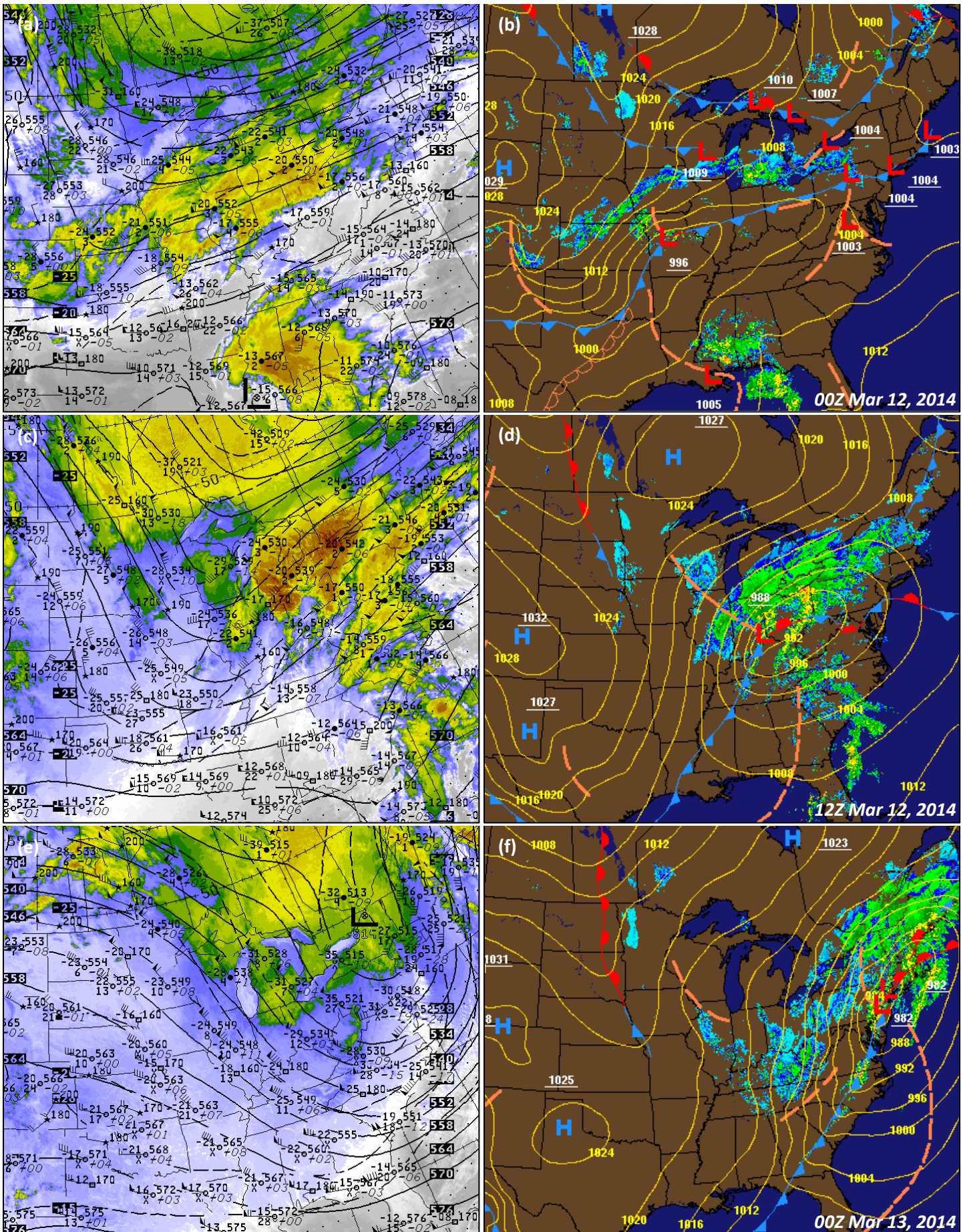


Fig. 3—500 hPa analysis overlaid on color-enhanced GOES-E infrared images (left) and WPC surface analyses with radar reflectivity (right) at 00Z March 12 (a, b), 12Z March 12 (c, d) and 00Z March 13, 2014 (e, f).