



## December 16-17, 2007 Winter Storm



### Summary

The first major snowstorm of the 2007-08 winter season for Vermont and northern New York, actually occurred prior to the Winter Solstice (December 22<sup>nd</sup> 108 am EST). Snowfall totals from this pre-winter storm ranged from 6 to 12 inches in southern Vermont, where a prolonged period of sleet and/or freezing rain occurred, to a rather uniform 12 to 18 inches across the rest of Vermont and northern New York.

On Saturday morning (15<sup>th</sup>), a strong and unseasonably cold high pressure system was located across northern New England and southeast Canada. Meanwhile, low pressure was developing across eastern Texas. This area of low pressure gradually strengthened and incorporated abundant moisture from the Gulf of Mexico, as it traveled to the Mississippi and western Ohio River Valleys by Saturday night. During Saturday night and early Sunday morning (16<sup>th</sup>), this primary low would continue to strengthen in the Ohio River Valley, while a coastal low would gradually develop along the mid-Atlantic coast, due to a strong, coupled upper-level jet stream as well as a deepening mid-atmospheric trough.

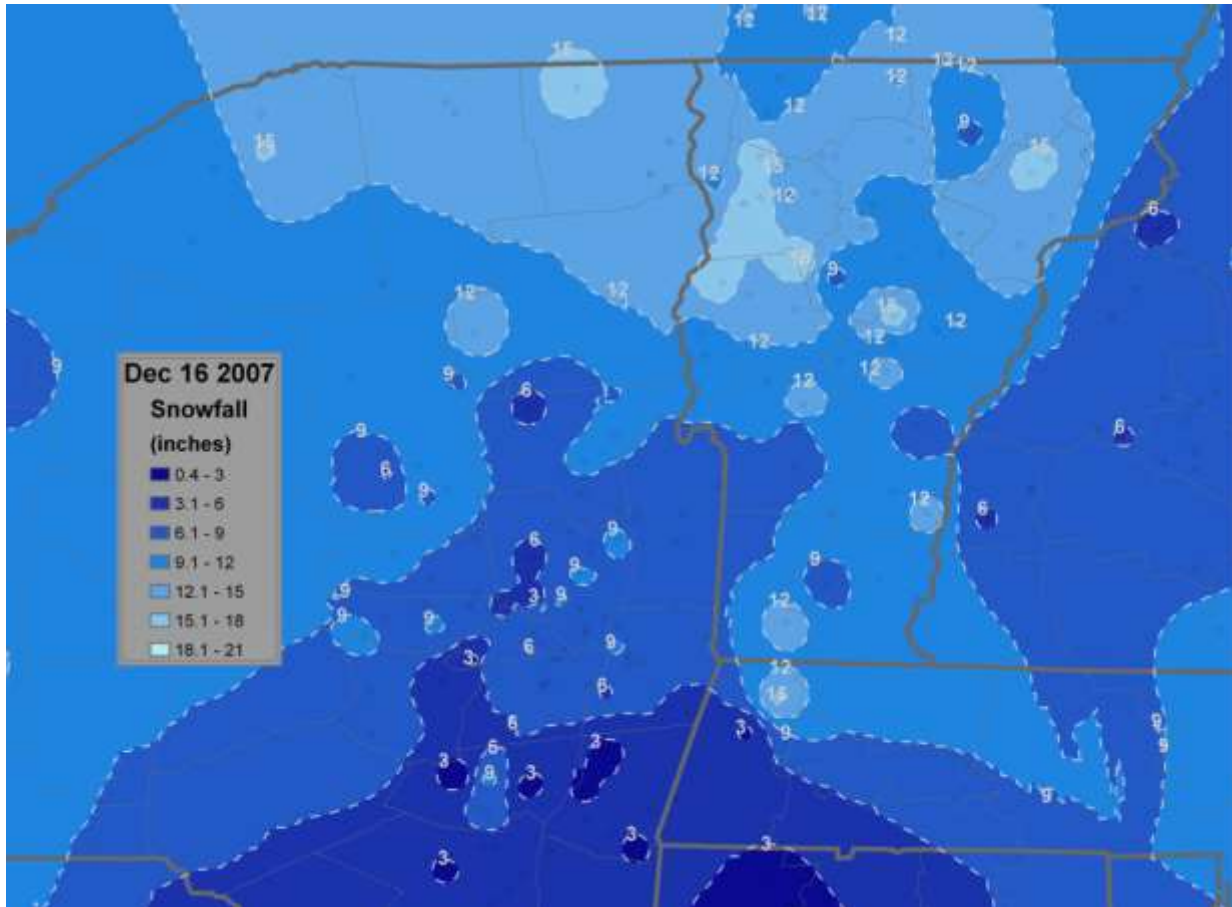
Snow began to overspread New York and Vermont early Sunday morning (16<sup>th</sup>) with snowfall rates rapidly increasing to over an inch per hour. The Ohio river valley storm maintained its strength during Sunday as it moved into the eastern Great Lakes, this allowed milder air aloft (4000-8000 feet) to move into the North Country, as well as drier air to be incorporated into the storm. These two factors caused precipitation to fall as a wintry mix (snow, sleet and freezing rain), as well as developed a lull in intensity of precipitation during the mid-late morning hours that lasted until mid-late afternoon. However, by late Sunday afternoon and continuing through Sunday evening, the secondary coastal storm intensified and this allowed the second part of this winter storm to wrap accumulating snow into northern New York and Vermont, as well as provided brisk winds that caused considerable blowing snow.

Although each winter storm is different in many ways...the same general characteristics are often very similar for major snowstorms in the North Country (Vermont and northern New York) and this storm exhibited these characteristics;

- A strong and sometimes "coupled" upper atmospheric jet stream
- A deepening long wave trough along with a strengthening, negatively-tilted short wave
- A strong temperature gradient from south to north and coastal vs. inland (Surface, 850mb, 700 mb)
- An abundant moisture supply (Gulf of Mexico or Atlantic)
- Surface low pressure track between Boston and outer Cape Cod, Massachusetts

## Snowfall Map

[Click on image to enlarge](#)



Storm total snowfall map depicts a wide swath of 12 to 18 inches across northern New York and the northern half of Vermont. This is where the precipitation mainly fell as snow, although there were some reports of sleet. Snowfall amounts of 6 to 12 inches occurred across southern Vermont, where milder and drier air accounted for a period of sleet and freezing rain as well as a longer lull in precipitation.

## Snowfall Reports

PUBLIC INFORMATION STATEMENT  
SPOTTER REPORTS  
NATIONAL WEATHER SERVICE BURLINGTON VT  
1005 AM EST MON DEC 17 2007

THE FOLLOWING ARE UNOFFICIAL OBSERVATIONS TAKEN DURING THE PAST 10 HOURS FOR THE STORM THAT HAS BEEN AFFECTING OUR REGION. APPRECIATION IS EXTENDED TO HIGHWAY DEPARTMENTS...COOPERATIVE OBSERVERS...SKYWARN SPOTTERS AND MEDIA FOR THESE REPORTS. THIS SUMMARY IS ALSO AVAILABLE ON OUR HOME PAGE AT WEATHER.GOV/BURLINGTON

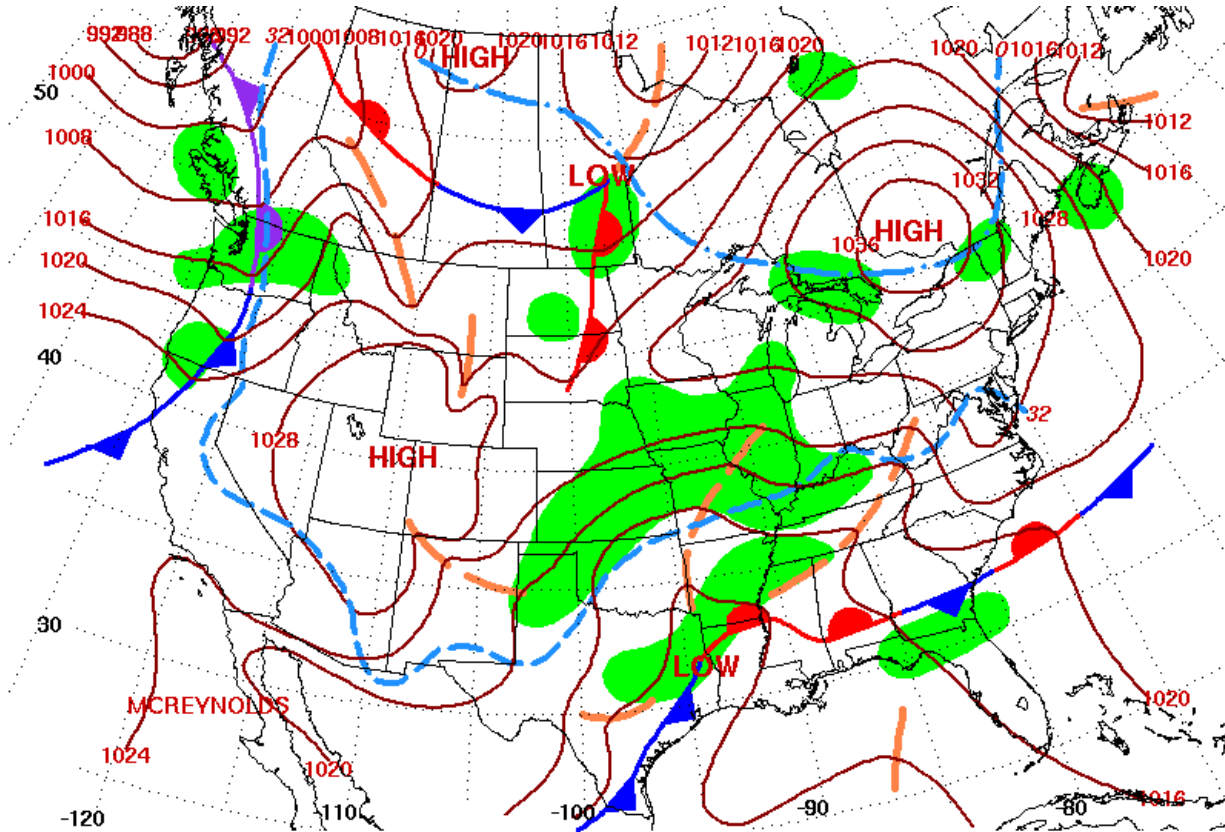
\*\*\*\*\*STORM TOTAL SNOWFALL\*\*\*\*\*

LOCATION	STORM TOTAL SNOWFALL (INCHES)	TIME/DATE OF MEASUREMENT	COMMENTS
NEW YORK			
...CLINTON COUNTY...			
PERU	19.2	555 AM 12/17	
ELLENBURG DEPOT	17.0	912 AM 12/17	COOP
AUSABLE CHASM	12.0	741 AM 12/17	HAM OPERATOR
PERU	12.0	756 AM 12/17	HAM OPERATOR
PLATTSBURGH	12.0	700 PM 12/16	RACES
PLATTSBURGH	12.0	745 AM 12/17	HAM OPERATOR
PERU	6.5	941 AM 12/17	
...FRANKLIN COUNTY...			
WHIPPLEVILLE	14.0	804 AM 12/17	COOP
MALONE	12.0	700 AM 12/17	COOP
SARANAC LAKE	12.0	750 AM 12/17	HAM OPERATOR
TUPPER LAKE	10.0	708 AM 12/17	COOP
...ST. LAWRENCE COUNTY...			
POTSDAM	15.5	843 AM 12/17	
EDWARDS	12.0	740 AM 12/17	HAM OPERATOR
NORFOLK	12.0	755 AM 12/17	HAM OPERATOR
OGDENSBURG	12.0	758 AM 12/17	HAM OPERATOR
CANTON	9.0	700 AM 12/17	COOP
VERMONT			
...ADDISON COUNTY...			
VERGENNES	17.8	800 AM 12/17	
NEW HAVEN	13.0	700 AM 12/17	COOP
SOUTH LINCOLN	13.0	700 AM 12/17	COOP
BRIDPORT	11.0	735 AM 12/17	
SHOREHAM	10.5	748 AM 12/17	HAM OPERATOR
...CALEDONIA COUNTY...			
WHEELLOCK	17.0	805 AM 12/17	1900 FT
SUTTON	15.7	700 AM 12/17	COOP
WEST BARNET	13.5	830 AM 12/17	
SAINT JOHNSBURY	12.9	903 AM 12/17	COOP
...CHITTENDEN COUNTY...			
HANKSVILLE	18.3	859 AM 12/17	COOP
MILTON	18.0	700 AM 12/17	NWS EMPLOYEE

ESSEX JUNCTION	17.6	901 AM	12/17	COOP
SOUTH BURLINGTON	15.5	730 AM	12/17	NWS EMPLOYEE
SOUTH BURLINGTON	15.5	841 AM	12/17	
SOUTH BURLINGTON	14.4	930 AM	12/17	AIRPORT
WESTFORD	13.0	715 AM	12/17	NWS EMPLOYEE
UNDERHILL CENTER	12.8	800 AM	12/17	NWS EMPLOYEE
JERICHO	11.4	745 AM	12/17	NWS EMPLOYEE
COLCHESTER	11.0	740 AM	12/17	NWS EMPLOYEE
...ESSEX COUNTY...				
EAST HAVEN	12.0	1003 AM	12/17	COOP
...FRANKLIN COUNTY...				
SAINT ALBANS	11.3	610 AM	12/17	COOP
HIGHGATE CENTER	9.0	739 AM	12/17	HAM OPERATOR
...LAMOILLE COUNTY...				
STOWE	15.0	1000 AM	12/17	2 MI SOUTH
CAMBRIDGE	15.0	842 AM	12/17	
EDEN	13.3	844 AM	12/17	COOP
JEFFERSONVILLE	12.5	859 AM	12/17	COOP
STOWE	11.0	326 AM	12/17	SPOTTER
...ORANGE COUNTY...				
BROOKFIELD	17.5	700 AM	12/17	COOP
CORINTH	12.1	700 AM	12/17	COOP
RANDOLPH CENTER	10.5	322 AM	12/17	SPOTTER
CHELSEA	10.0	324 AM	12/17	COOP
CHELSEA	10.0	712 AM	12/17	COOP
...ORLEANS COUNTY...				
NEWPORT	12.0	700 AM	12/17	COOP
EAST ALBANY	8.0	847 AM	12/17	COOP
...RUTLAND COUNTY...				
CHITTENDEN	15.0	959 AM	12/17	1000 FT COOP
BRANDON	10.0	958 AM	12/17	POST OFFICE
RUTLAND	7.5	800 AM	12/17	COOP
WALLINGFORD	7.0	1003 AM	12/17	
...WASHINGTON COUNTY...				
MARSHFIELD	14.0	824 AM	12/17	
WATERBURY CENTER	12.5	839 AM	12/17	
PLAINFIELD	9.5	848 AM	12/17	COOP
MONTPELIER	9.0	854 AM	12/17	COOP
WAITSFIELD	8.0	800 AM	12/17	COOP
...WINDSOR COUNTY...				
SPRINGFIELD	14.0	843 AM	12/17	
BETHEL	13.0	700 AM	12/17	COOP
ROCHESTER	10.0	700 AM	12/17	COOP
CAVENDISH	9.5	720 AM	12/17	COOP
WOODSTOCK	7.0	822 AM	12/17	COOP

## Surface Map on Saturday December 15th at 7am

[Click on image to enlarge](#)



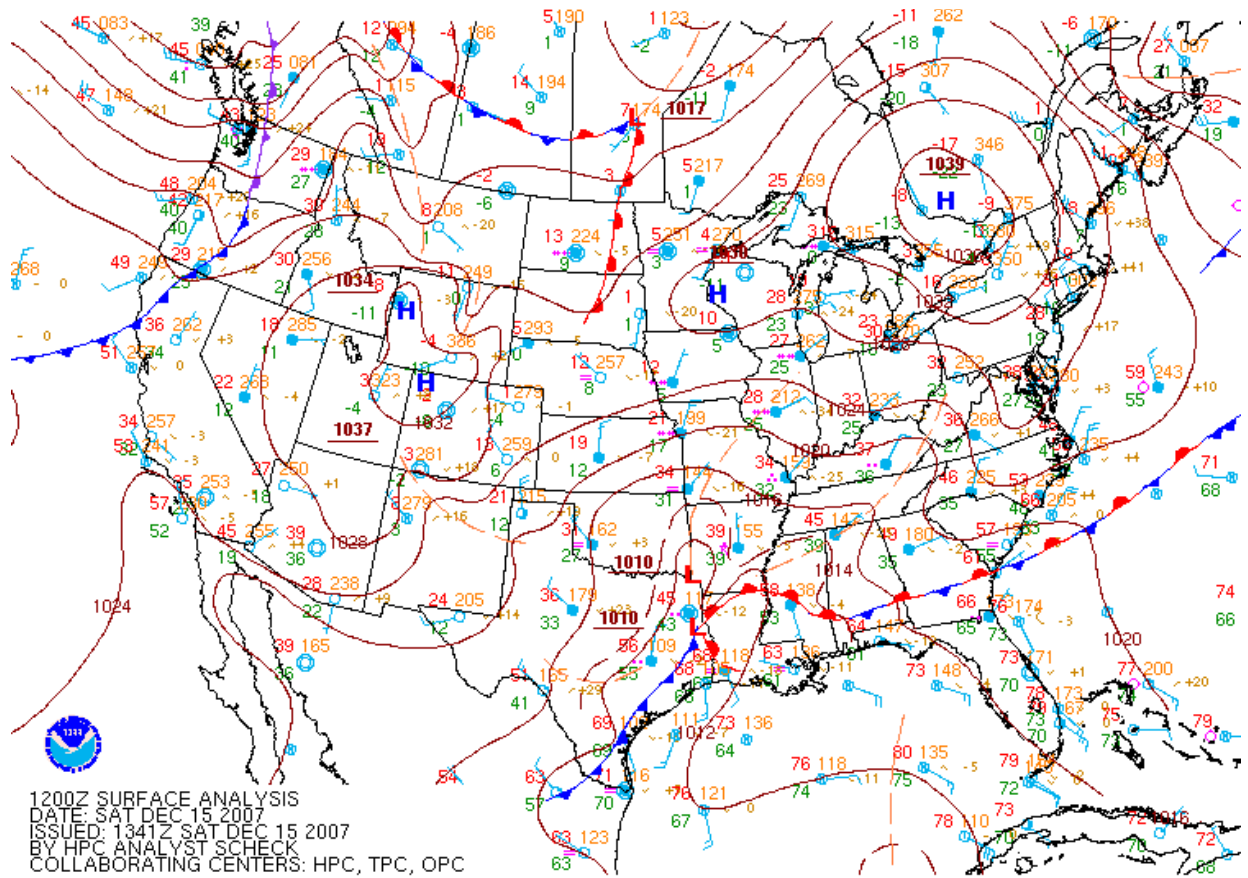
Surface Weather Map at 7:00 A.M. E.S.T.

Saturday morning minimum temperatures were around Zero and Saturday afternoon maximum temperatures were in the upper single numbers and teens.

## Evolution of Surface Low Track

7am EST Saturday 12/15 to 7am EST Monday 12/16

[Click on image to enlarge](#)

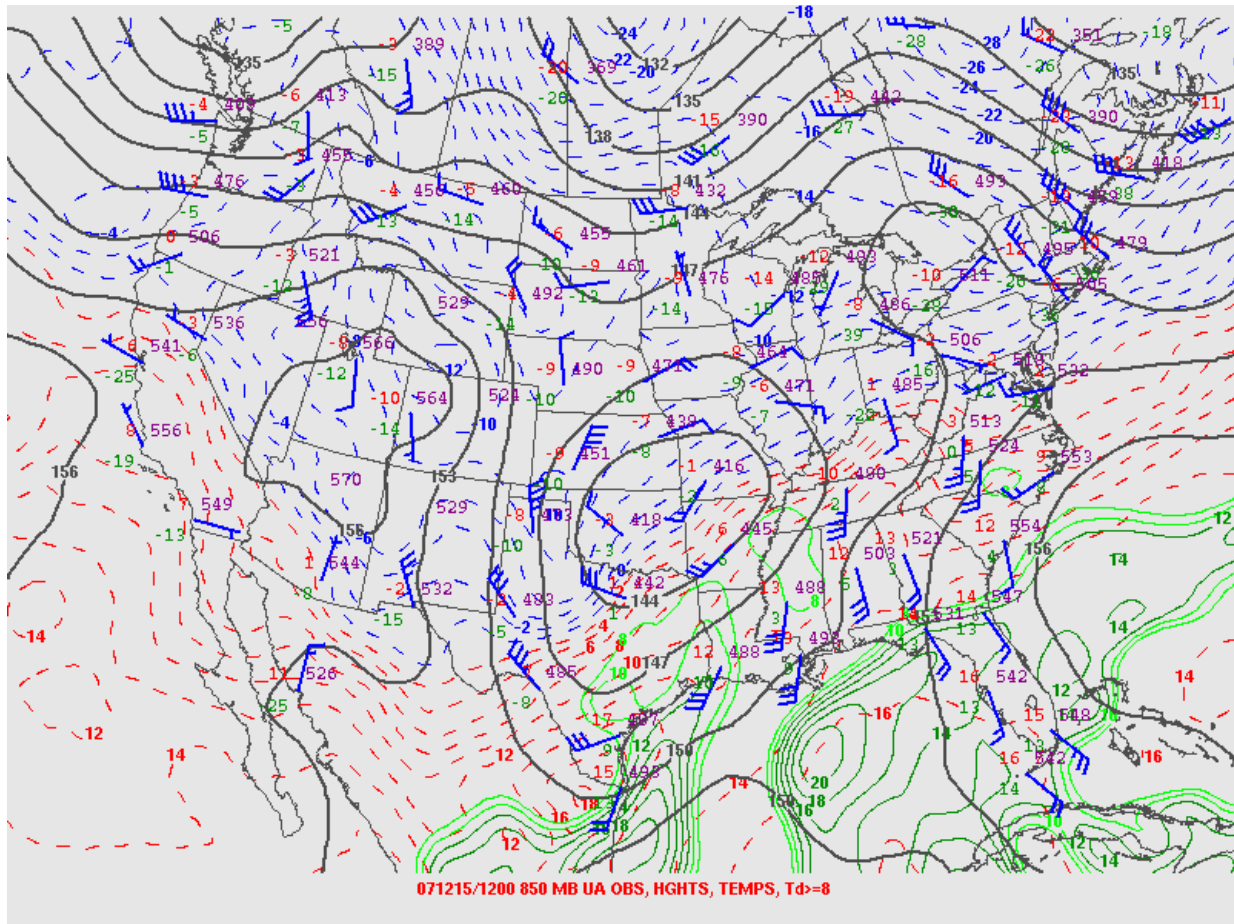


Surface low across Texas and Louisiana on Saturday morning strengthens as it moves into the Ohio River Valley Saturday night and Sunday. Meanwhile, a secondary coastal low slowly develops off the Mid-Atlantic coast Sunday, becoming the main system Sunday night.

## Track of 850mb Low, Thermal Gradient and Moisture

Saturday Morning at 7am EST (12/15) to Sunday Night at 7pm EST (12/16)

[Click on image to enlarge](#)



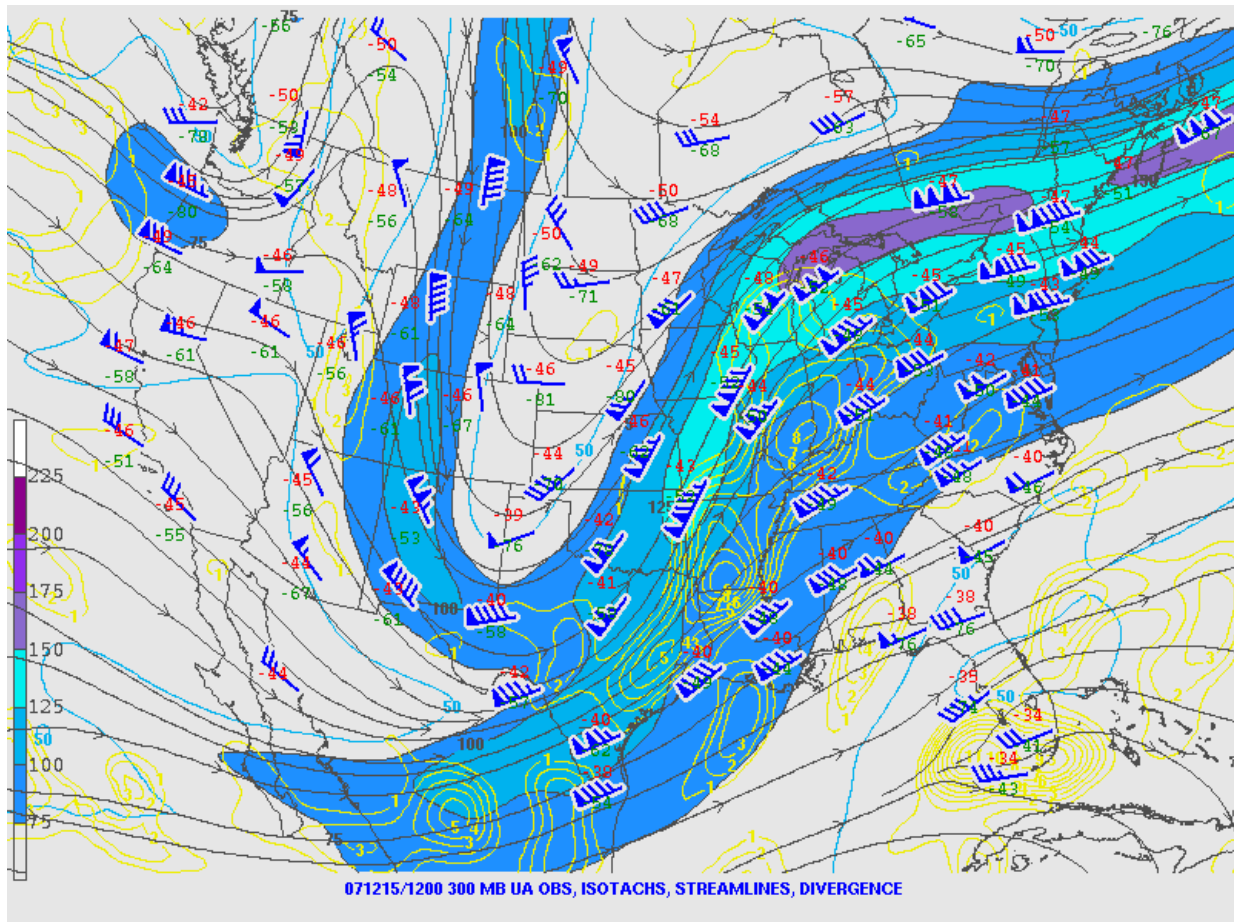
850mb closed low across southern Plains/Mississippi River Valley on Saturday morning lifts northeast and rapidly intensifies across Ohio River Valley before moving across New England on Sunday. The tight gradient of isotherms (blue and red dashed lines) shows the "clash in air masses" and potential low-level energy available. Abundant moisture from the Gulf of Mexico (solid green lines) on Saturday lifts up the east coast on Sunday.



## Upper Level Jet Stream (300mb)

Saturday Morning at 7am EST (12/15) to Sunday Night at 7pm EST (12/16)

[Click on image to enlarge](#)



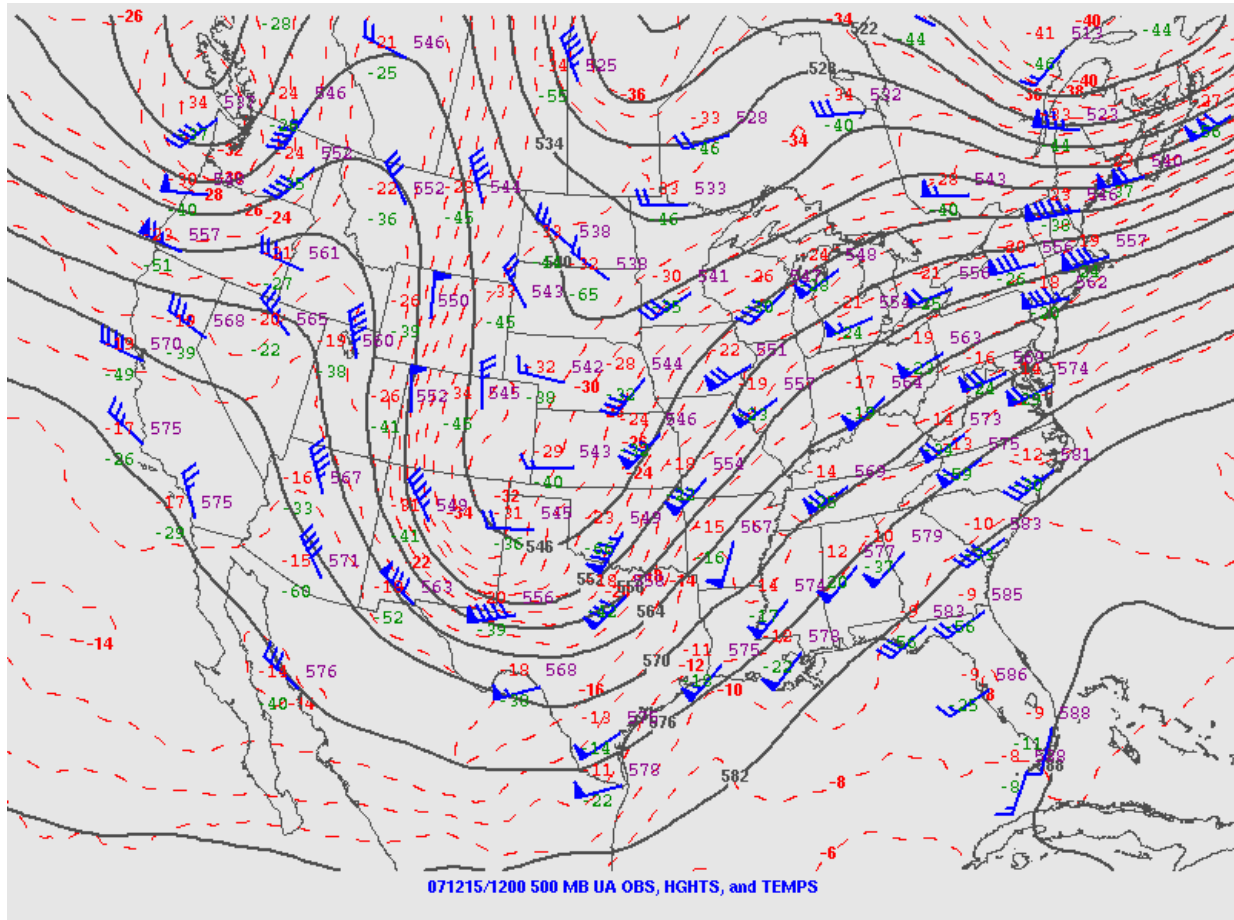
Upper level jet stream (300 mb) with double-jet structure, including an 140kt jet streak progresses eastward. This double-jet structure creates upper-level divergence which promotes strong upward vertical motion and accounts for storm intensification.



## Mid-Atmospheric Trough (500mb)

Saturday Morning at 7am EST (12/15) to Sunday Night at 7pm EST (12/16)

[Click on image to enlarge](#)

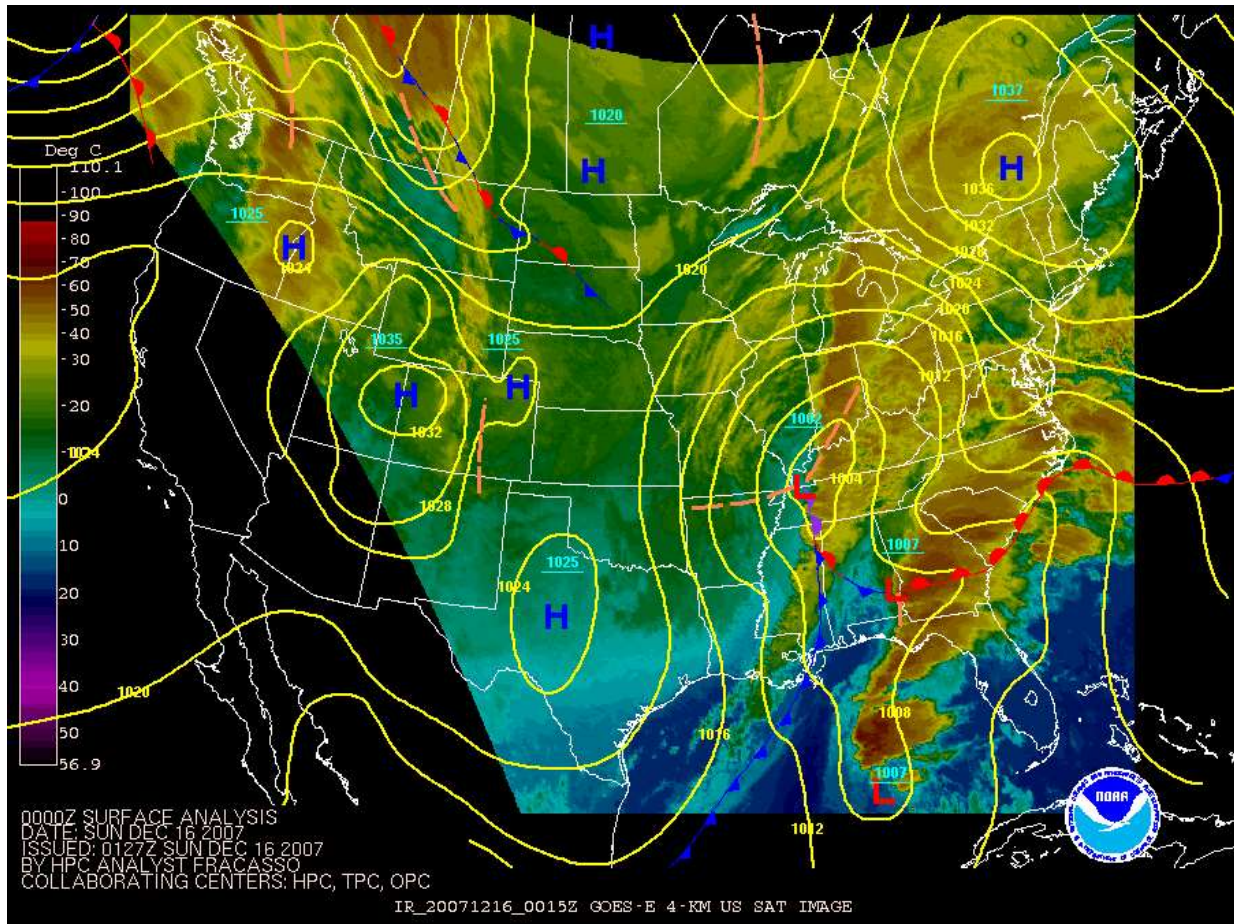


Short wave within long wave trough axis across central US on Saturday morning proceeds to strengthen, eventually becoming cut-off as it lifts northeast in negatively tilted trough axis across the northeast on Sunday.

## Infrared Satellite and Surface Time Lapse

Saturday Morning at 7am EST (12/15) to Sunday Night at 7pm EST (12/16)

[Click on image to enlarge](#)

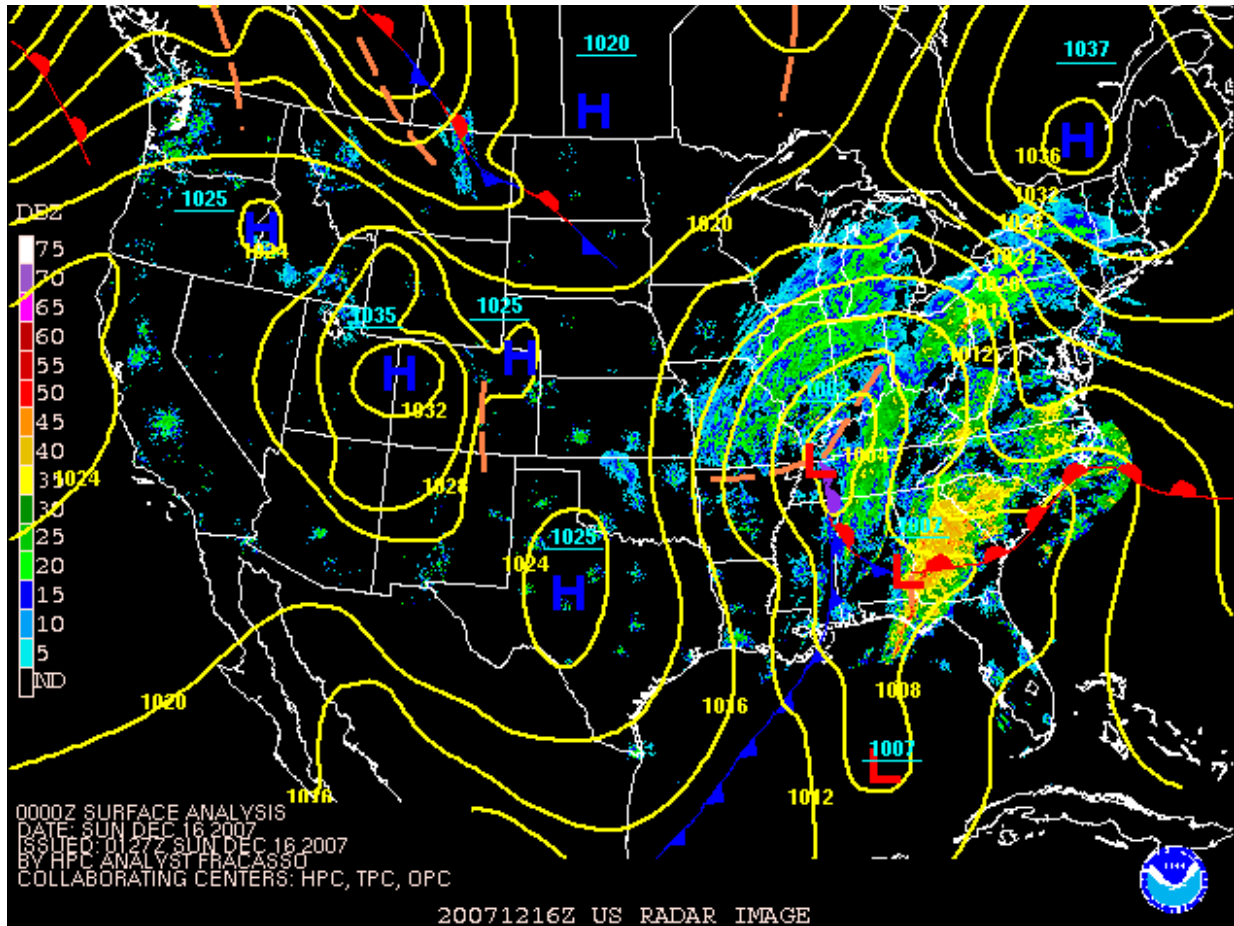


Abundant moisture is being tapped from the Gulf of Mexico and being transported northeast into New England as the storm approaches the region.

## Radar and Surface Time Lapse

Saturday Morning at 7am EST (12/15) to Sunday Night at 7pm EST (12/16)

[Click on image to enlarge](#)



Snow overspreads the Northeast after Midnight (EST) on Sunday (12/16), followed by a lull in precipitation across much of New England and New York during the late morning through early afternoon hours. Meanwhile, steadier snow continues across western New York and Ontario before shifting east across the North Country later in the day.