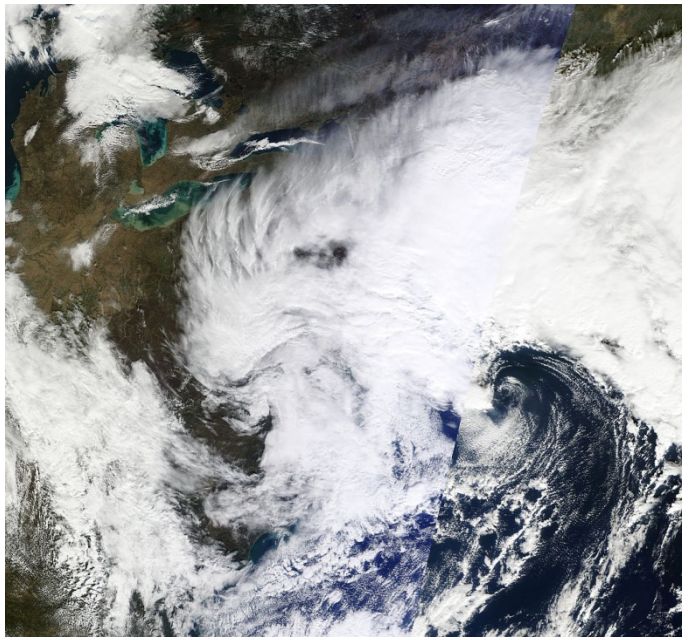
Analysis of the 2012 November Nor'easter

Jacob Dolinger
ATM 350
University at Albany

Background Information

- Mid-level shortwave gets picked up by a trough over the Southeastern U.S.
- This allowed the system to form as a nor'easter as it rode the trough up the East Coast
- Plenty of moisture and favorable location in the jet exit region helped feed the storm
- Deep pocket of cold air over the Eastern third of the nation amplified snow risk



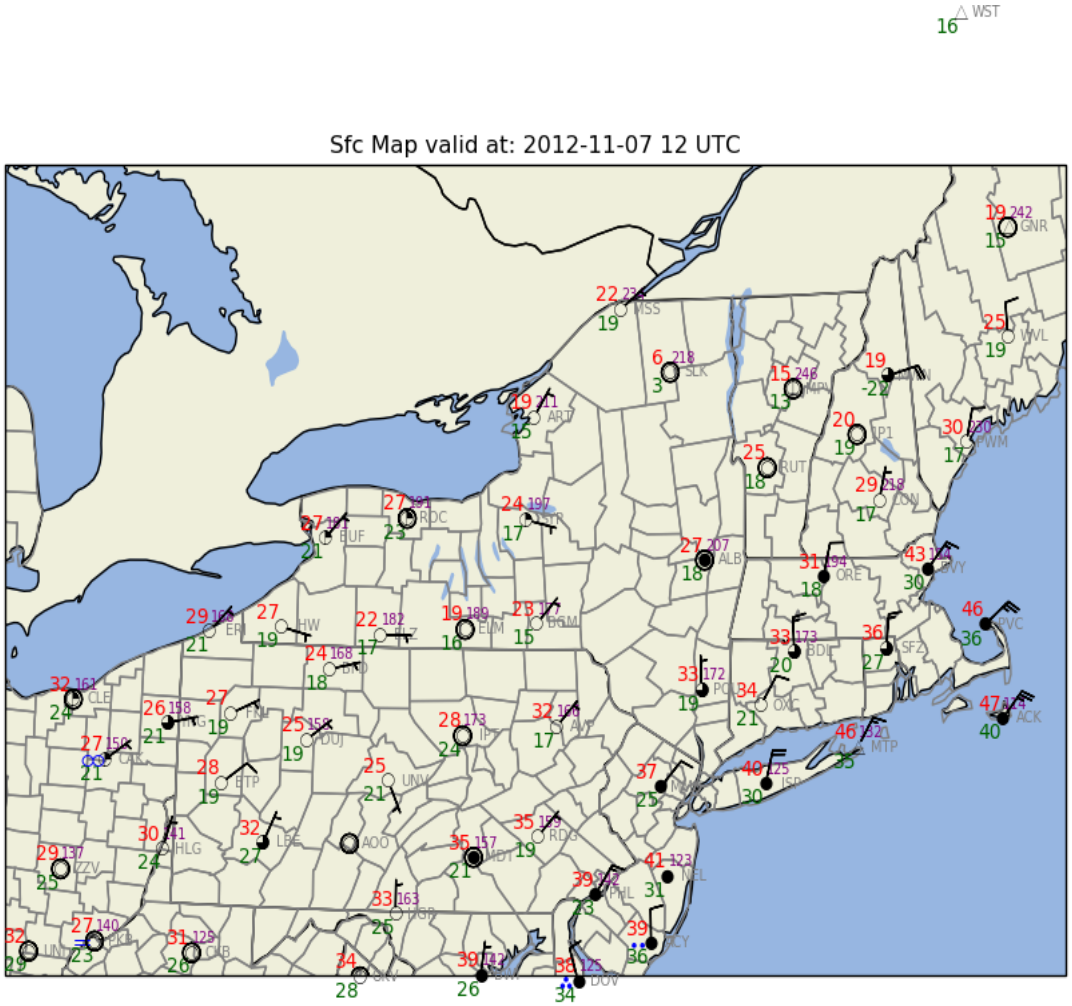
Why the Timing Could Not Have Been Worse

- The storm began forming on November 6th as a shortwave, and was fully formed as a Category 1 winter storm (NOAA RSI Index) by the 7th
- Hurricane Sandy, the monster storm that devastated the Northeast Coast, hit no more than 7 days earlier
- Many people still had not even fully returned to their homes or had power (I myself got power back just the day before the Nor'easter, after 6 days without it)

What You'll See Here

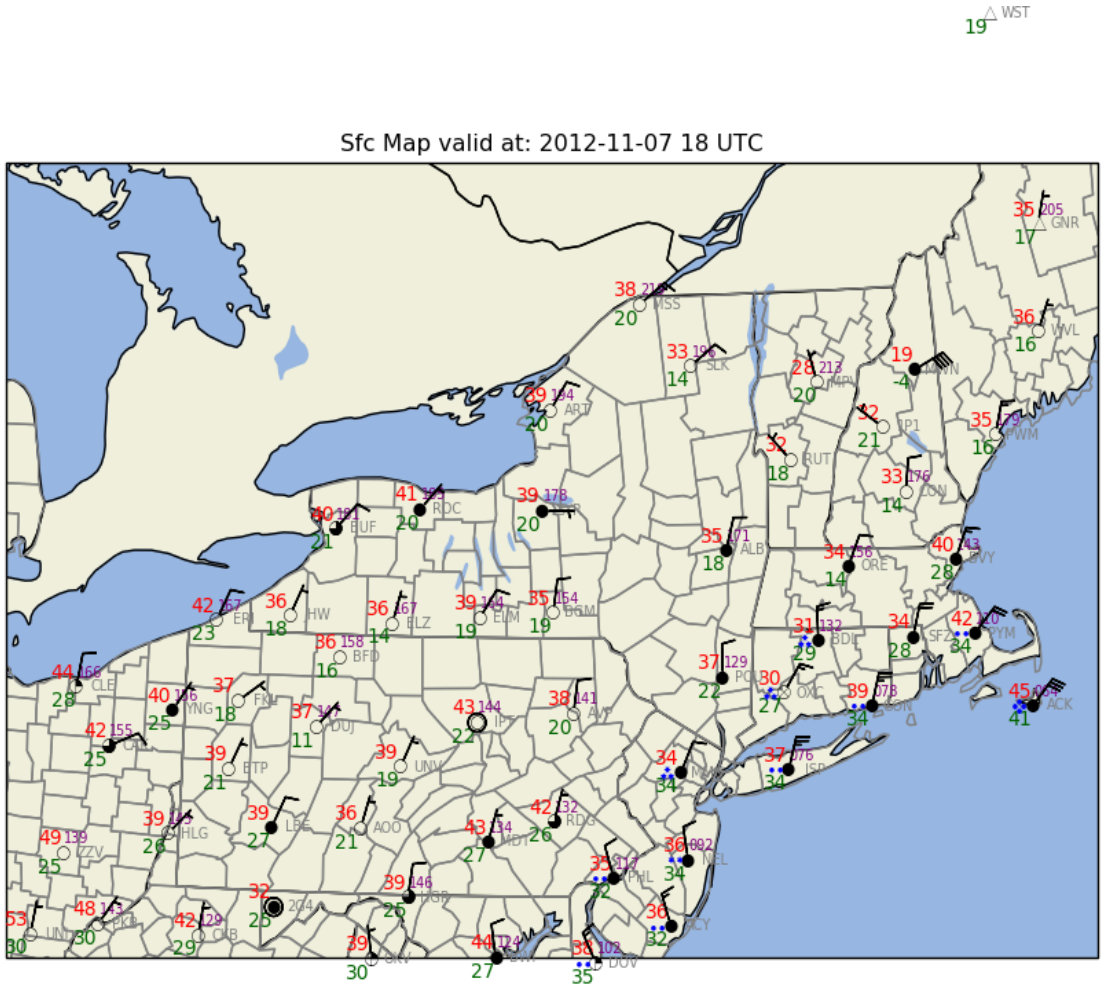
- Surface Analyses of the Eastern Region of the U.S. as the Nor'Easter skirt the coast
- Soundings from CHH and OKX showing conditions during the storm's passage throughout the coastal Mid-Atlantic and New England
- Radar footage of snow hitting the Tri-State area
- Plots describing vorticity and temperature advection of the storm

Surface Analysis November 7th, 2012 12z



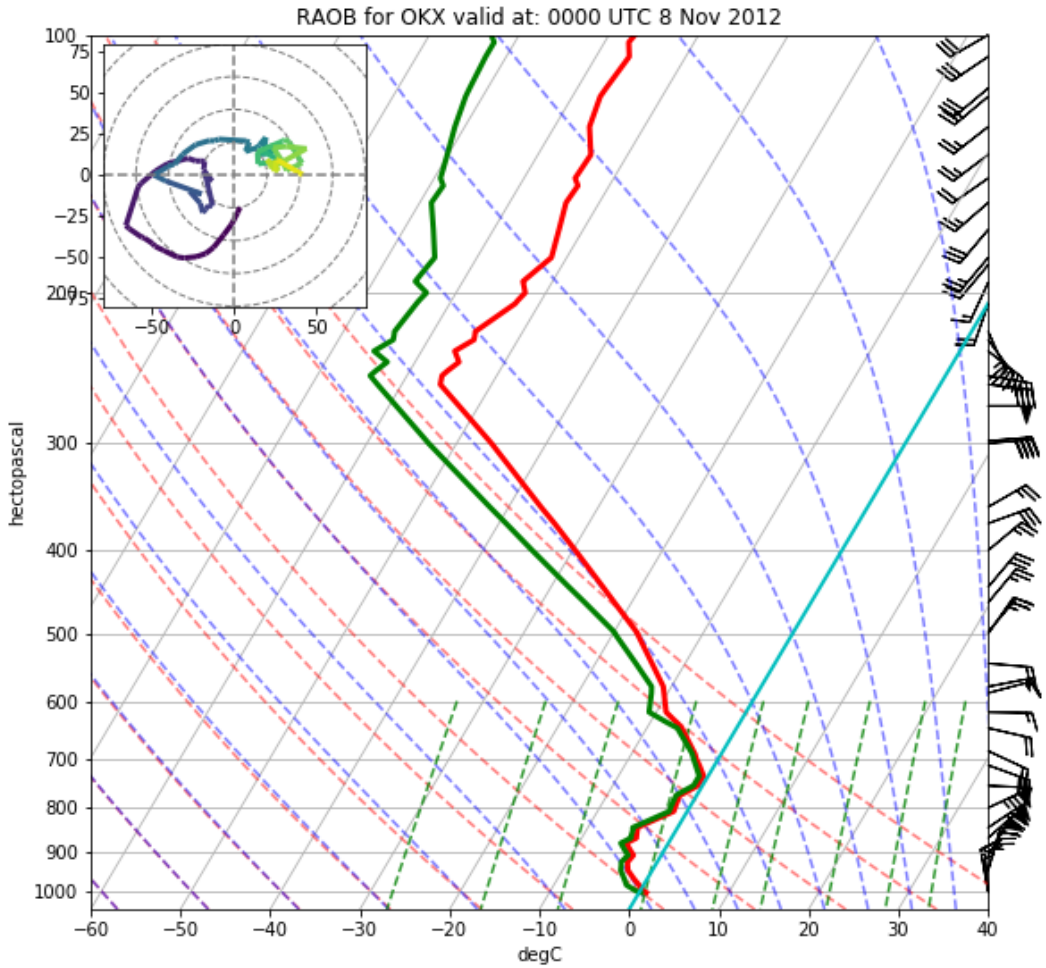
- Winds are oriented counter-clockwise indicating a cyclonic circulation over the Atlantic somewhere S-SE of the NYC Metro Area
- Relatively moist air near coast as indicated by dewpoints
- Snow begins in S. Mid-Atlantic

Surface Analysis- November 7th, 2012 18z



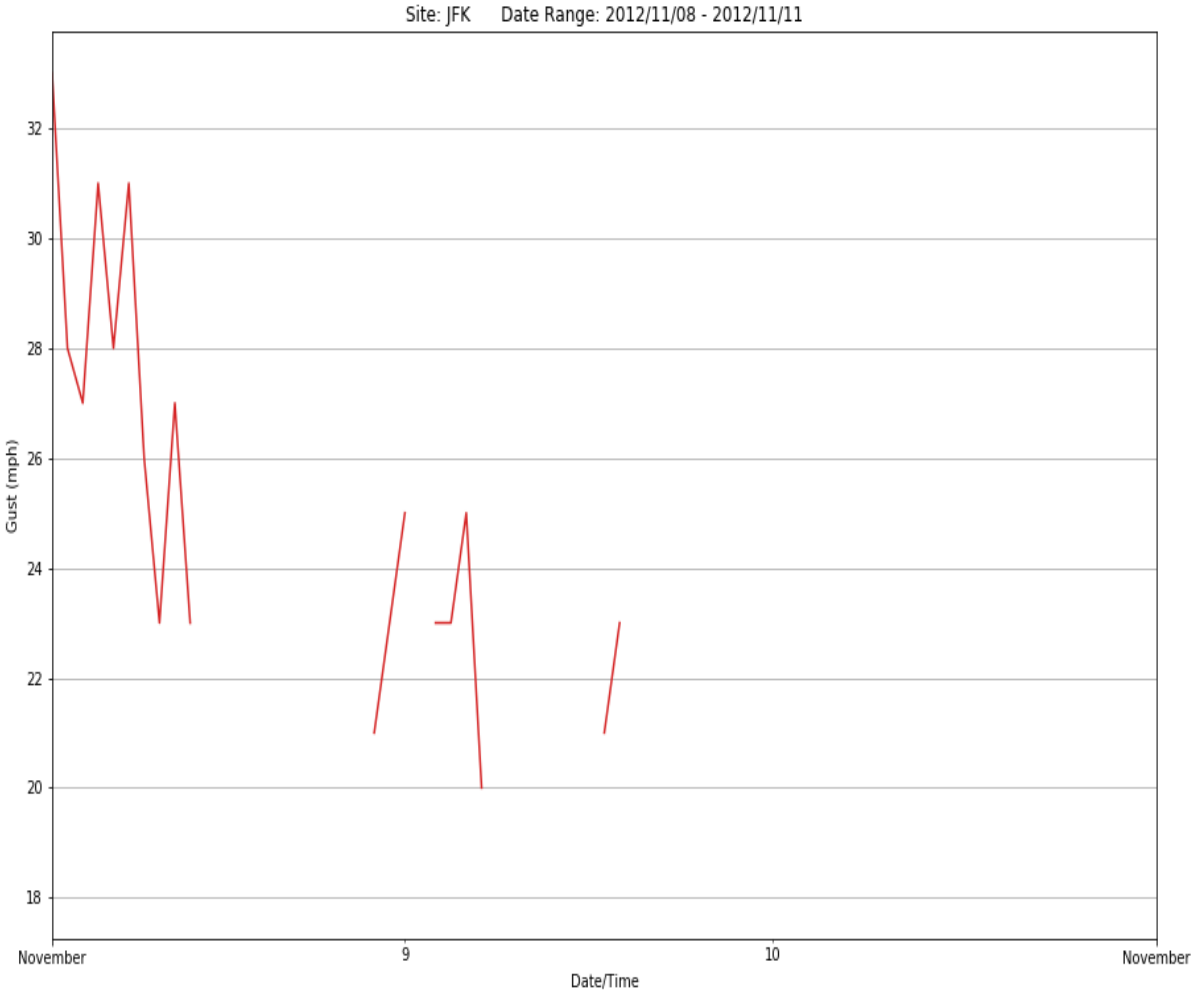
- Center of cyclone has moved slightly northward
- Moderate snow moved into much of the NYC Metro Area and S. New England
- Winds along the coast have increased slightly

Sounding from OKX- November 8th 2012 00z



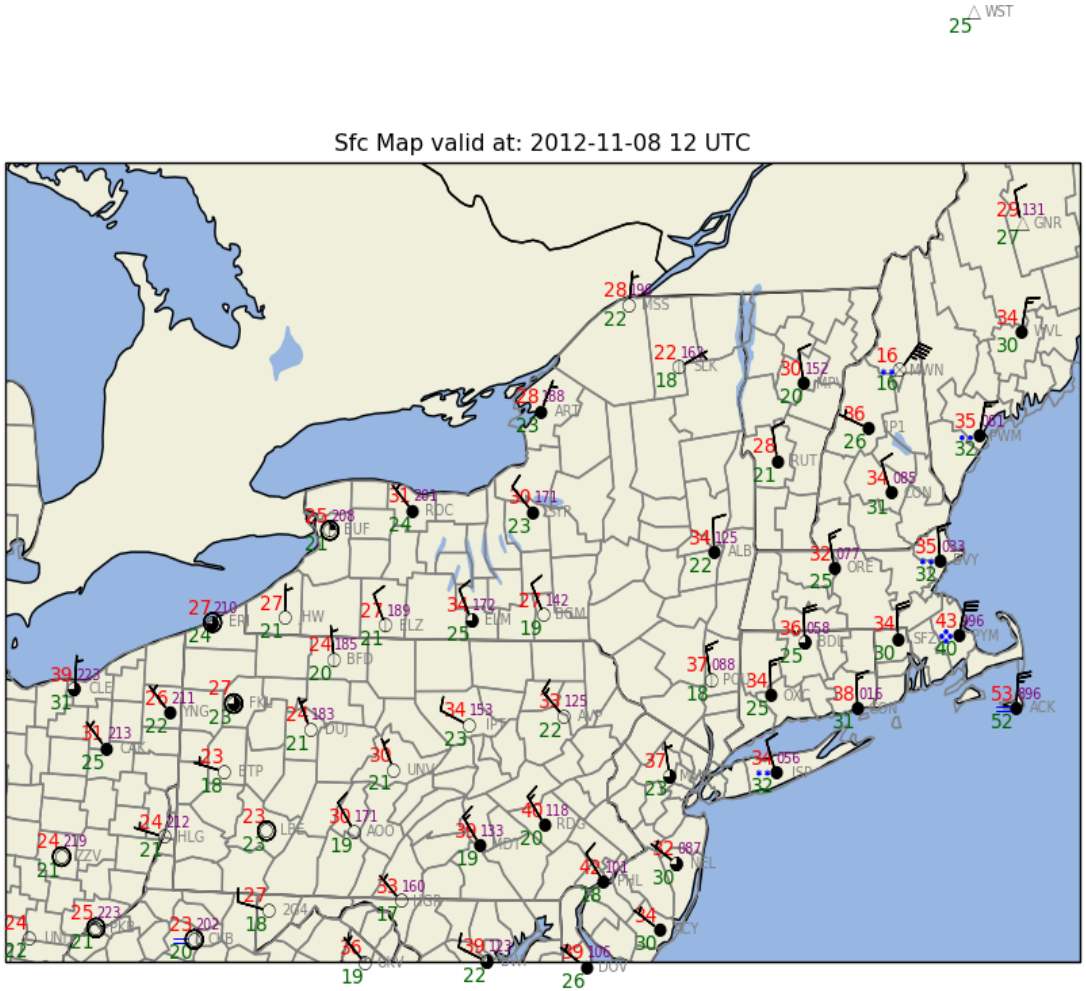
- Surface temperatures in the NYC area were right around freezing, just cold enough for snow to make it to the ground
- An extremely saturated sounding as well indicates that the snow was probably heavy wet snow due to the snow to liquid equivalency
- Southwesterly winds aloft may also indicate this was downstream of a trough that was likely advecting cold air over the region

A Gusty Day at JFK



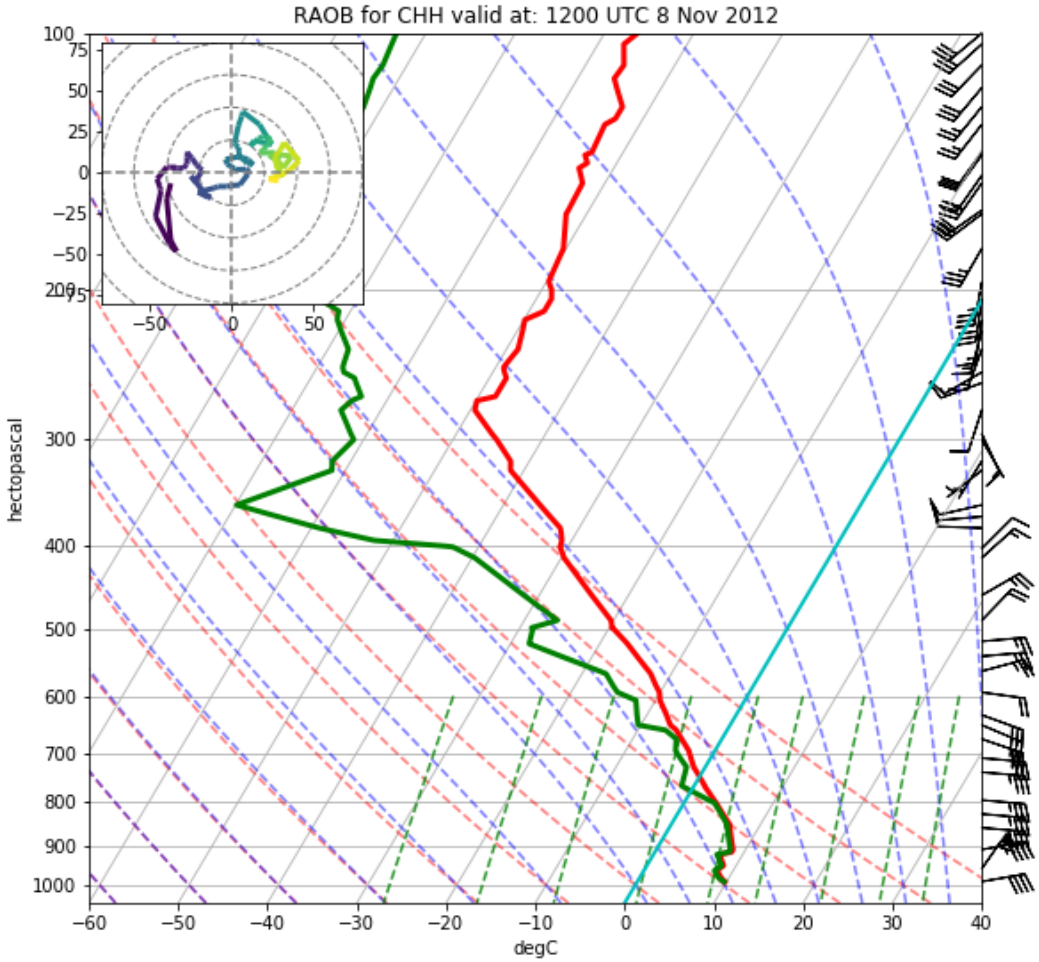
- Gusts at JFK topped 32 mph at the height of the storm
- Gusts continued until the storm's full exit near the 10th

Surface Analysis- November 8th 2012 12z



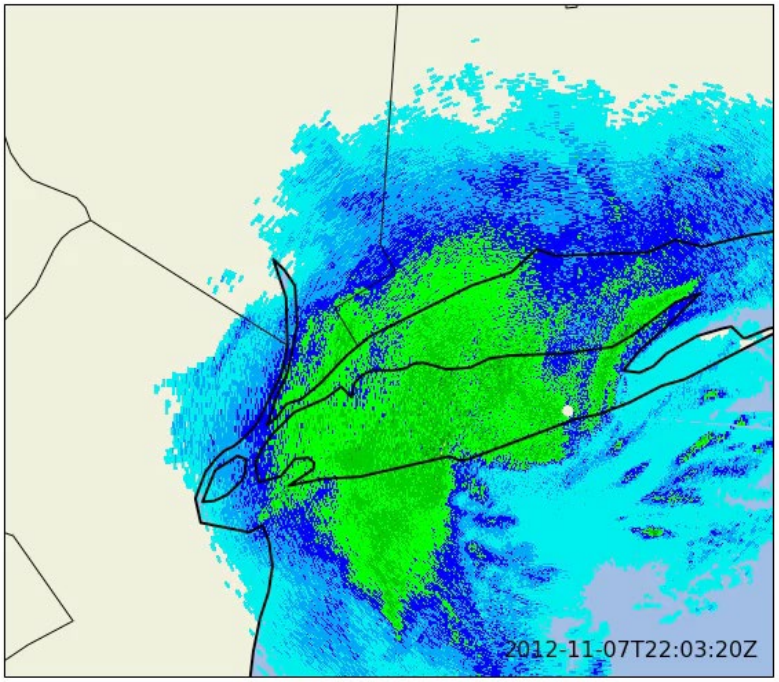
- By 12z on the 8th, the storm was centered somewhere off Cape Cod
- Snow and winds were subsiding in the NYC Metro area but just picking up in coastal Massachus etts

Sounding from CHH- November 8th 2012 12z



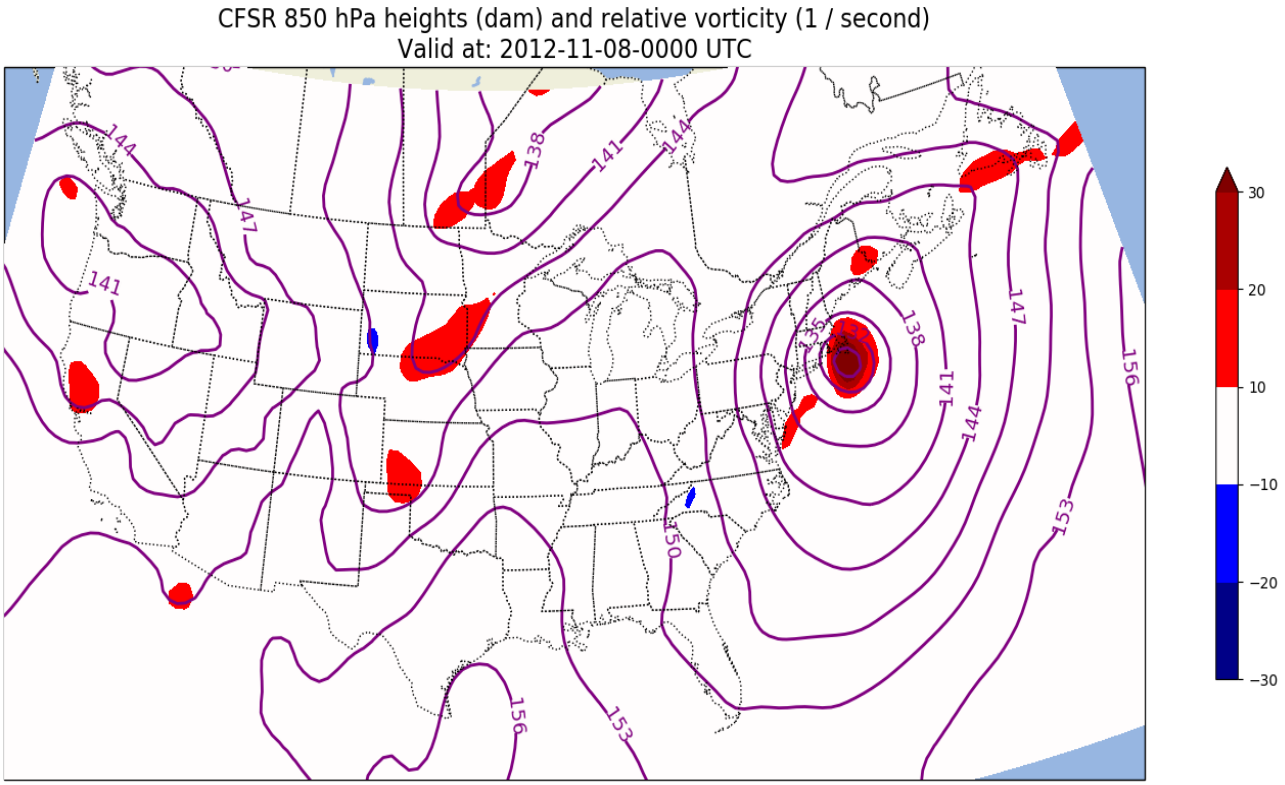
- Temperatures in the Cape Cod/Nantucket vicinity were in the 50s, so precipitation initially fell as rain
- Winds, due to the proximity to the center of the storm, were high even at the surface at 40 knots

Radar Imagery from OKX



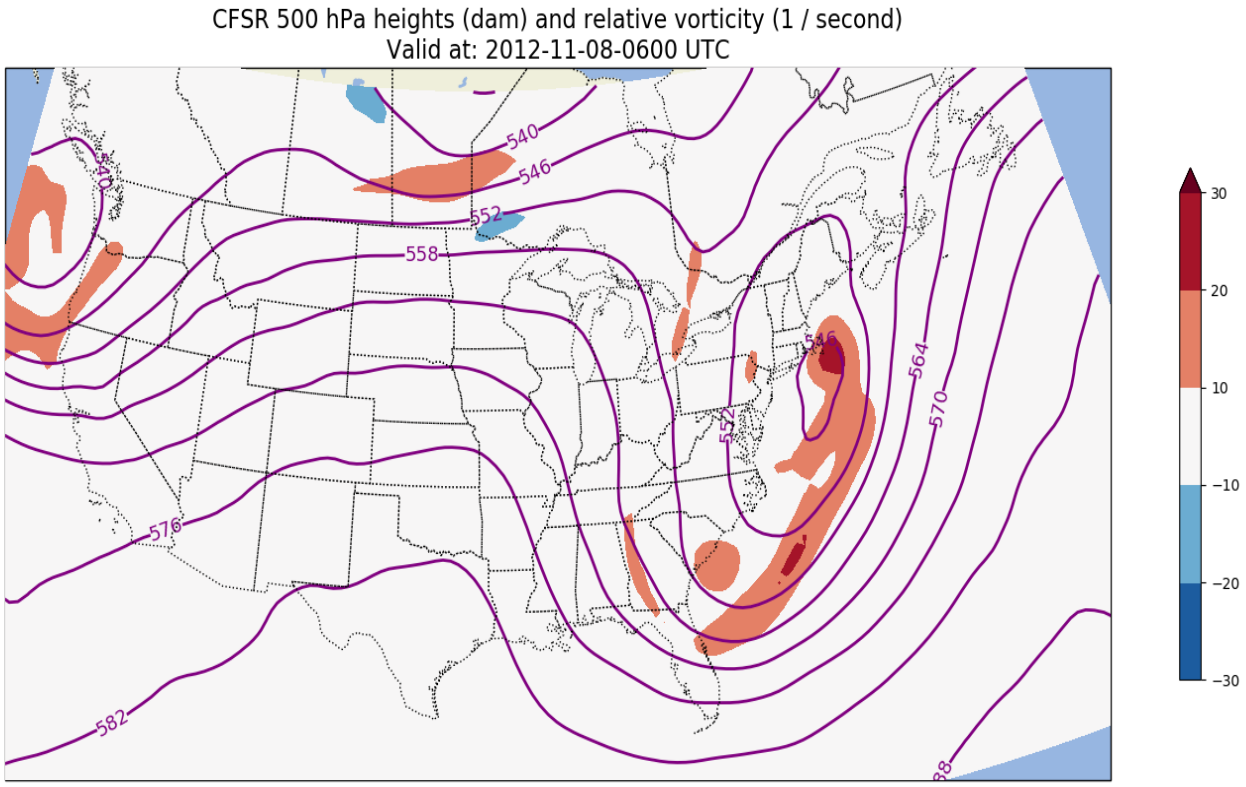
- Reflectivity on radar imagery from OKX shows the heaviest bands of snow set up right over Long Island and southwestern Connecticut
- This caused headaches for forecasters, most of whom had placed coastal areas in the mostly warm, rainy sector and western regions such as NJ and western PA in snow

The Storm's Vorticity



- Vorticity is a measure of a system's rotation
- Vorticity plots from the time period of the storm show the strength of the cyclone as it barreled up the East Coast
- The storm's strength was not overly anomalous but was relatively strong for mid-Fall and was not expected right after Sandy

Temperature Advection during the Nor'easter



- Temperature advection during the storm was happening mostly due to the storm's warm sector pushing northward
- Warm, moist air was advected ahead of the storm, but it was really only a small area that made it into the warm sector at all
- This plot explains why CHH in the earlier sounding was significantly warmer during the storm's passage and why they experienced mostly rain
- The storm itself did not advect cold air over the region, rather it was the trough behind it

Summarizing the Storm

- The Nor'easter that followed Hurricane Sandy was a relatively strong cyclone, which was not conducive to post-Sandy recovery efforts
- 715,000 people were without power throughout the Northeast following the Nor'easter
- A max wind gust of 76 mph was recorded around coastal Massachusetts
- Over 13 inches of snow fell in Connecticut
- There were 4 fatalities, despite some mandatory evacuations for coastal areas

https://www.wpc.ncep.noaa.gov/storm_summaries/event_reviews/2012/Early_Season_NorEaster_Nov2012.pdf