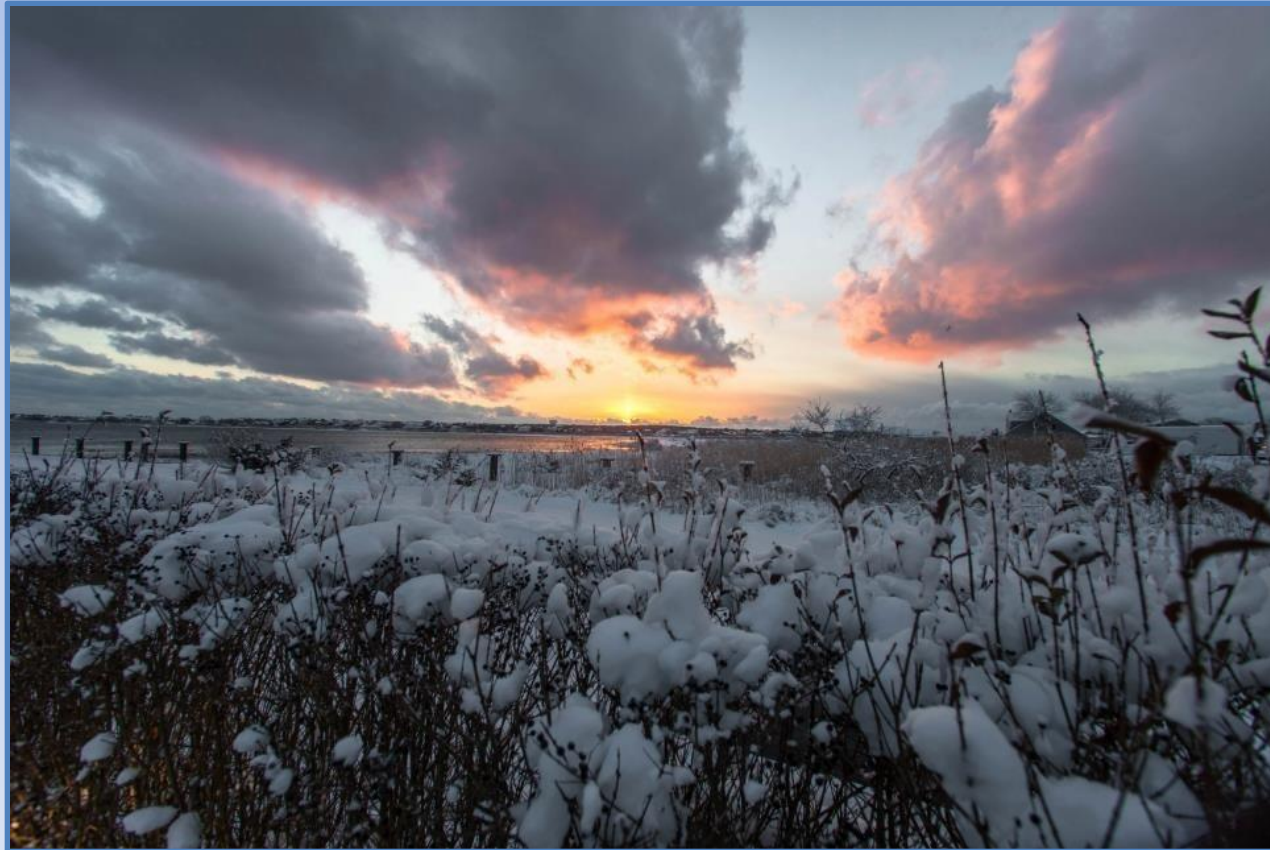
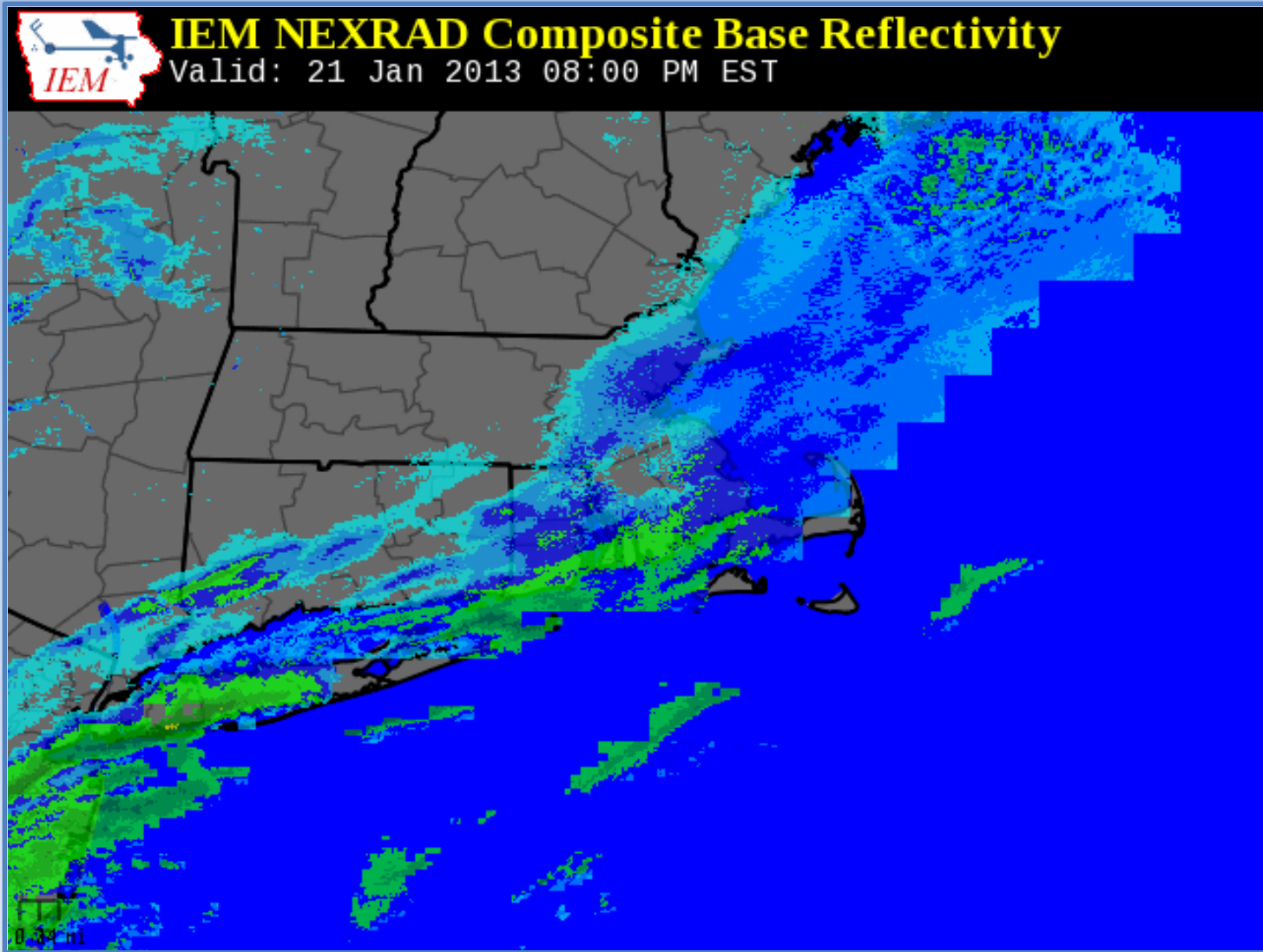


***Event Review:***  
**January 21-22, 2013**  
**“Norlun Trough”**

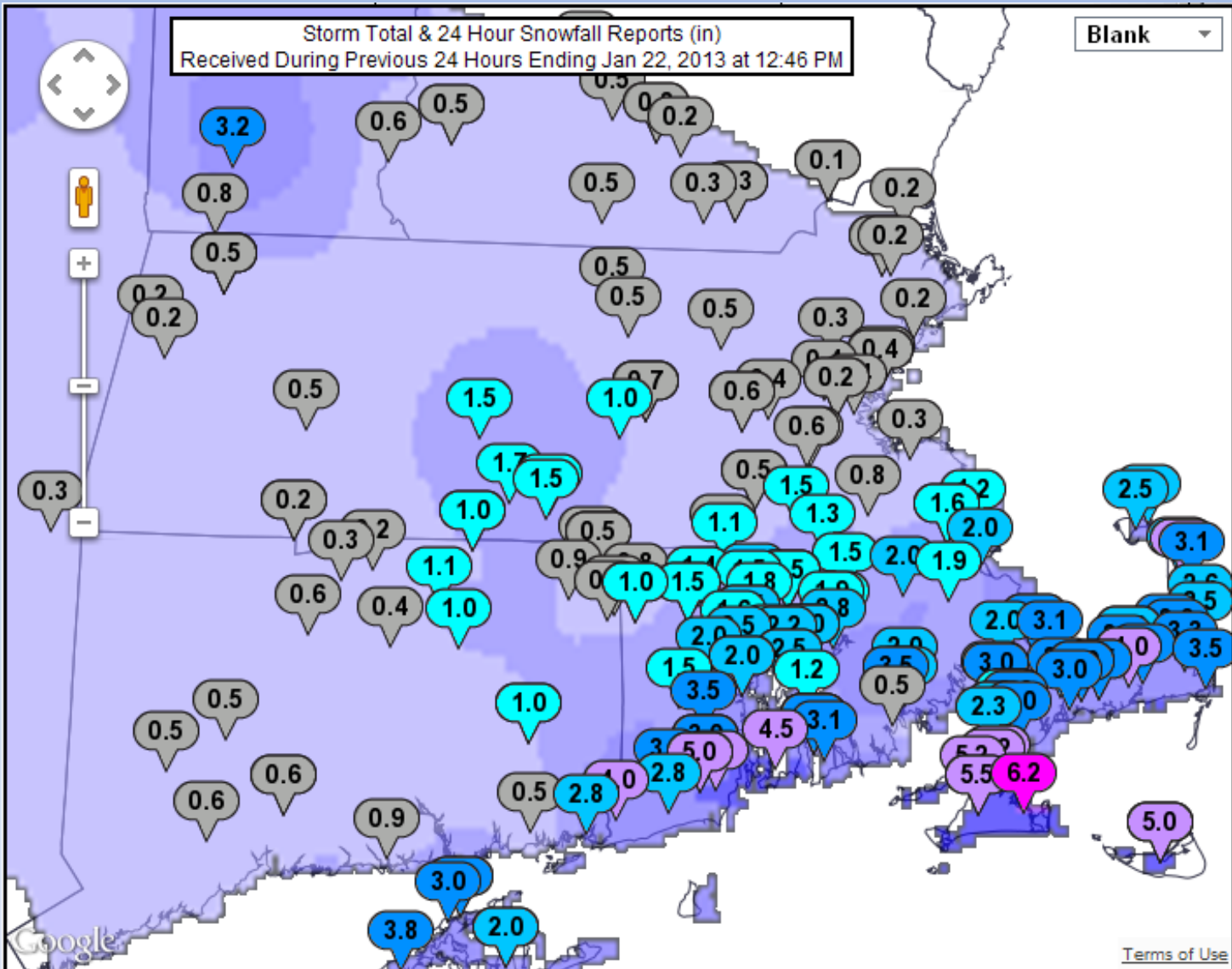


**Nantucket, MA on January 22**

# What Happened

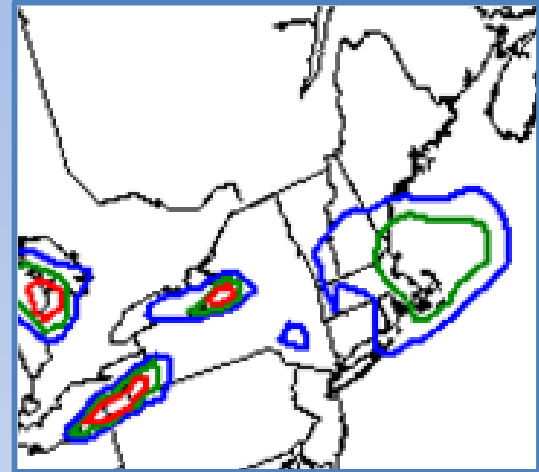
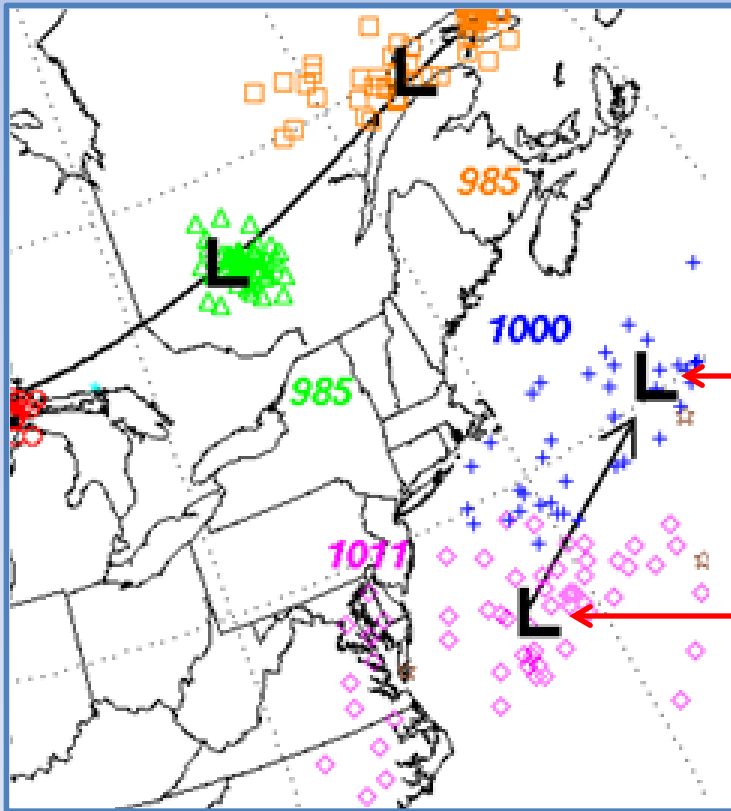


# What Happened

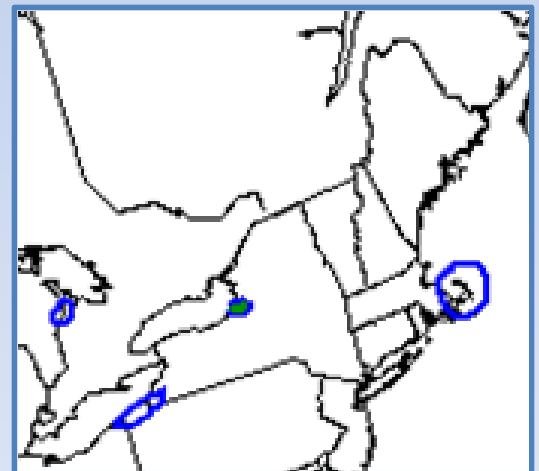


# HPC Forecasts

Low pressure tracks well south and east of Nantucket. Moderate probability of >4" near the coast, slight probability of >8" on Cape Cod



Probability of 4+ Inches

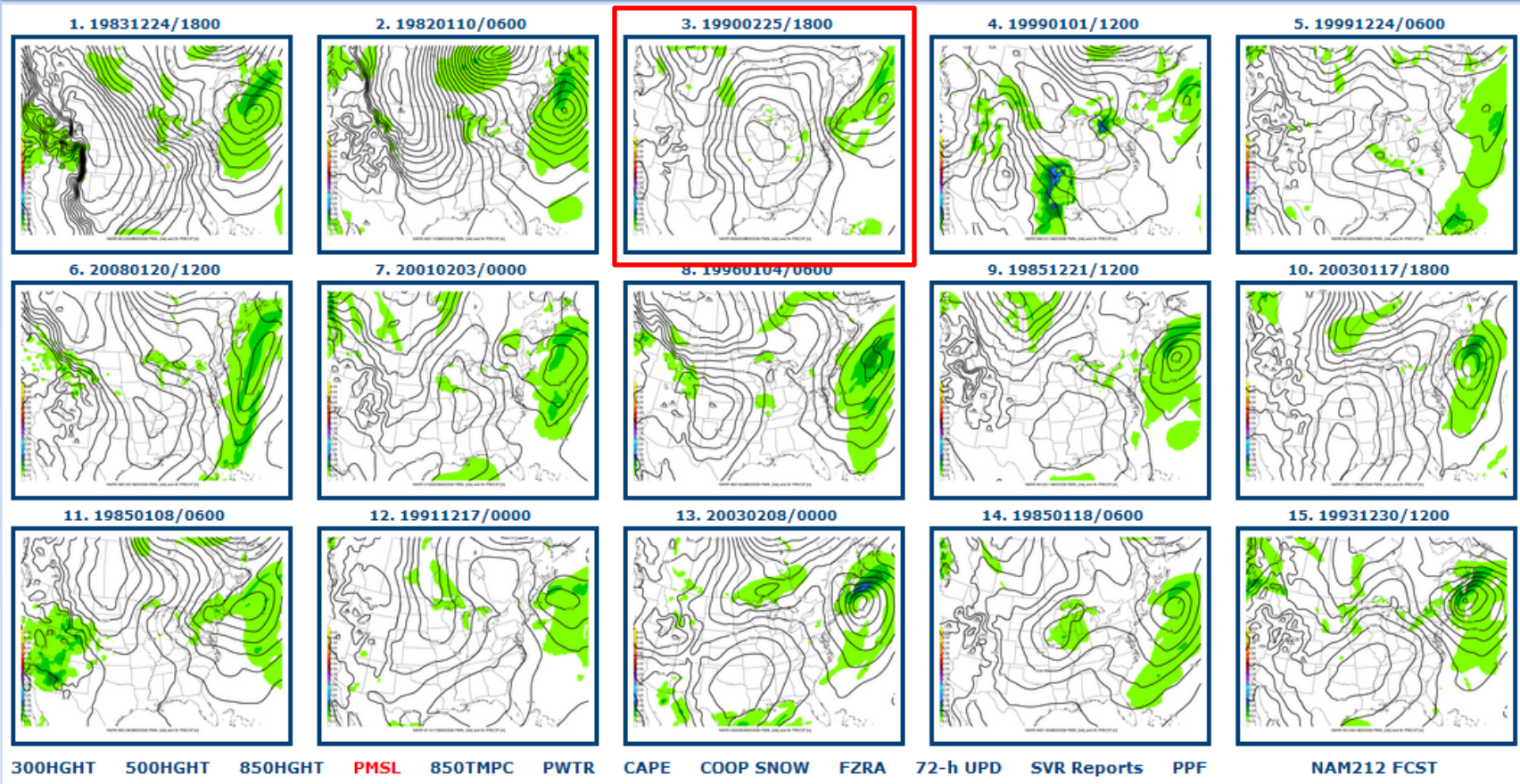


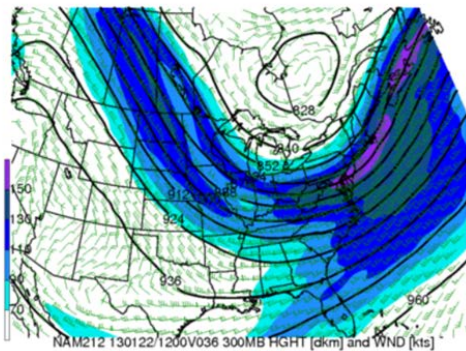
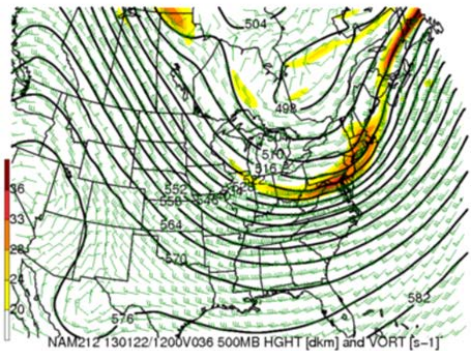
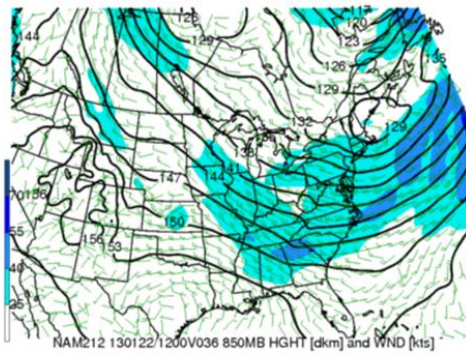
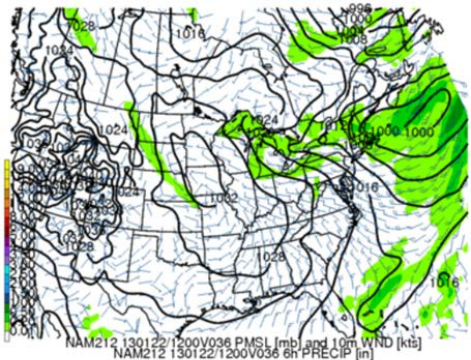
Probability of 8+ Inches

# CIPS Analogs (F+36)

Best Comparison: 25 Feb 1990  
(Hint of Norlun Trough)

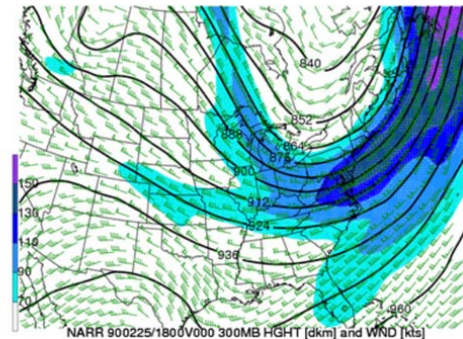
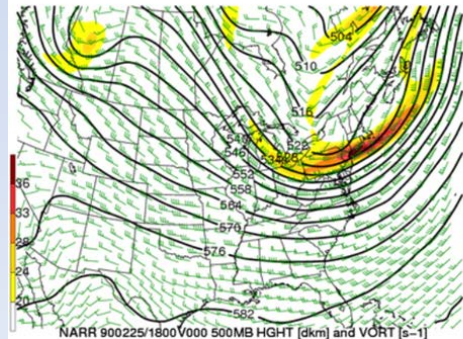
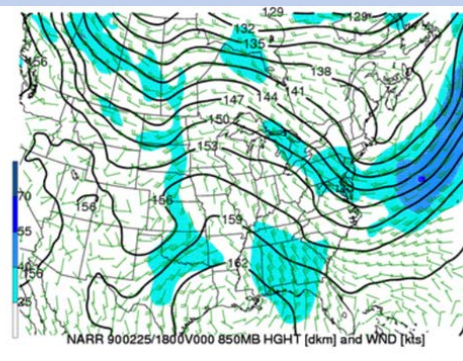
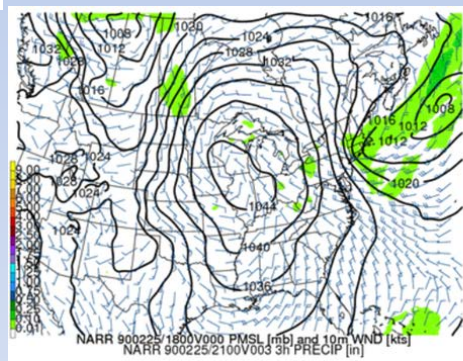
Analog Run: NAM212 20130121/0000F036 East Coast





**January 22, 2013**

Upper air patterns are very similar. Somewhat of a stronger jet/short wave than in 1990.



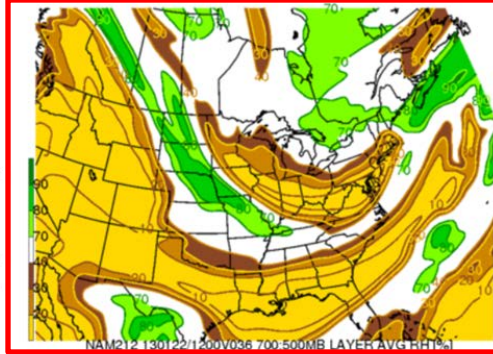
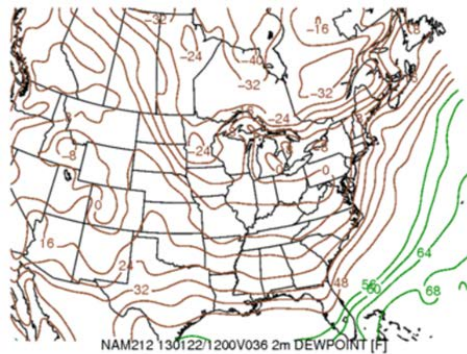
SFC

850 mb

500 mb

300 mb

**February 25, 1990**

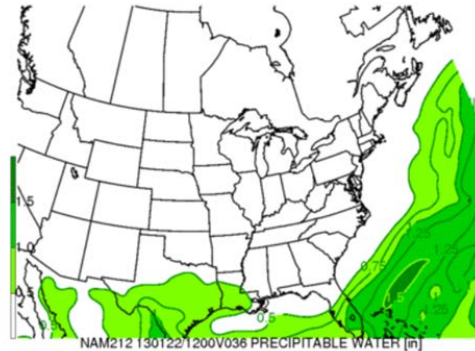
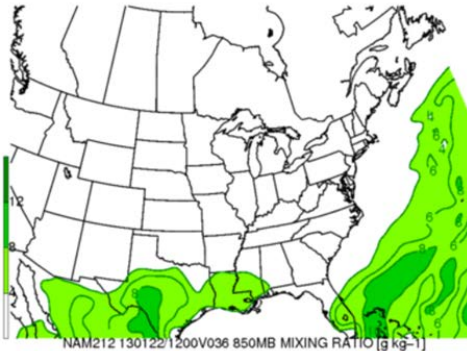


2m Dewpoint

700-500 mb RH

850 mb Mixing R

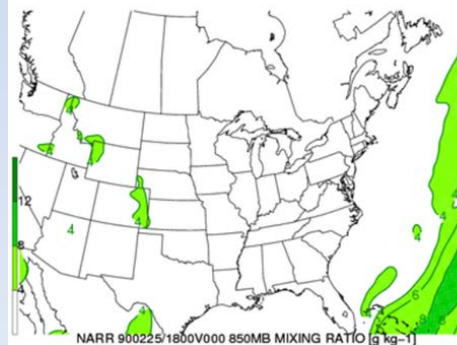
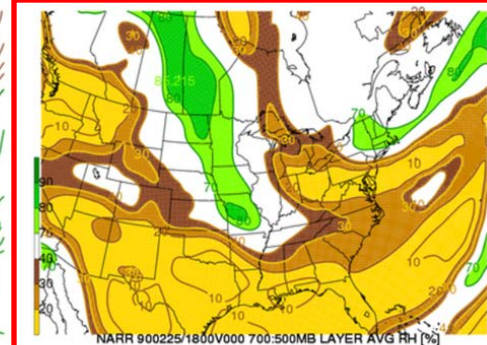
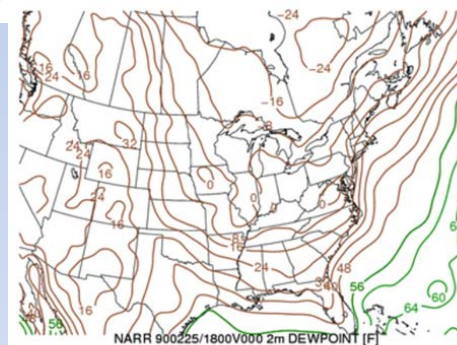
Precipitable Water

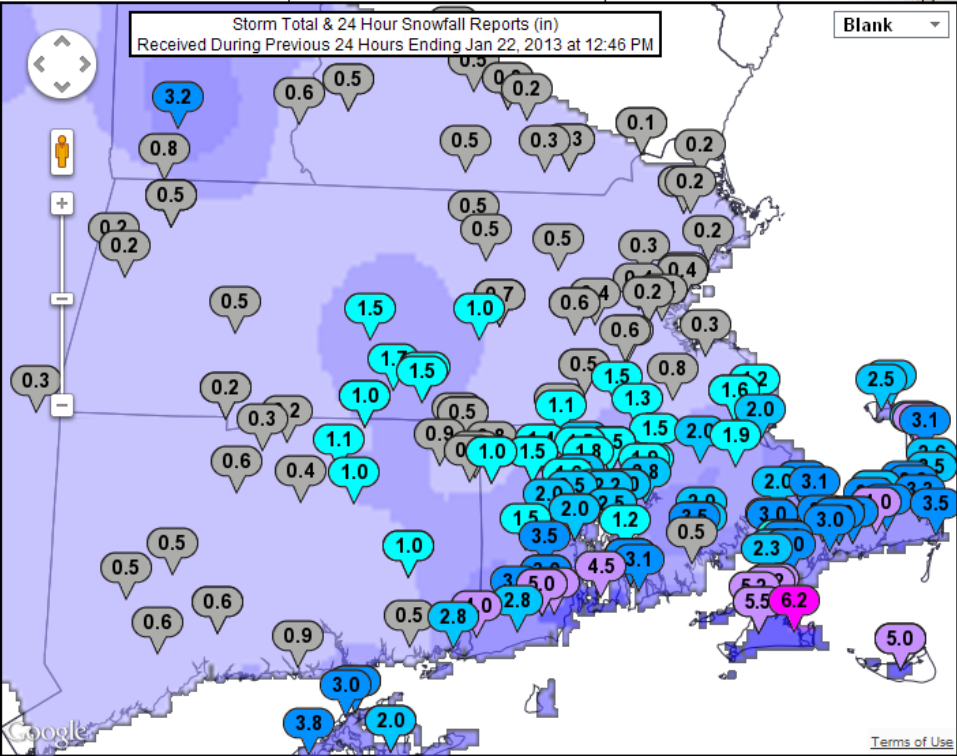


**February 25, 1990**

**January 22, 2013**

Note presence of drier air over southern New England, as opposed to ribbon of moisture in 1990, when drier air was displaced more to the south. **Potential red flag!**



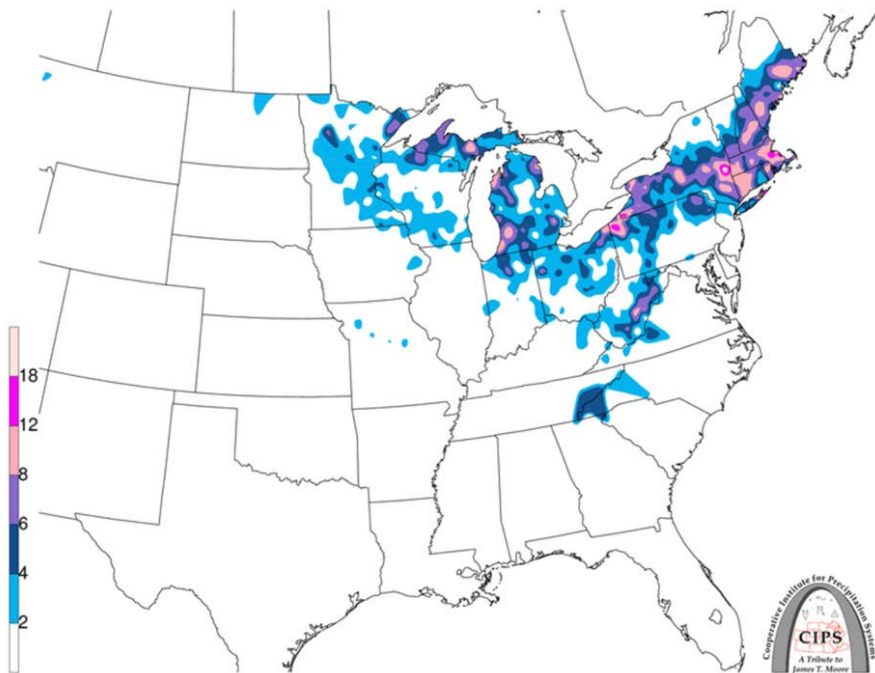


**February 25, 1990:  
Max 8-14"**

**January 22, 2013:  
Max 3-6"**

The presence of mid level dry air was one reason why snowfall totals were much lower than in the 1990 event.

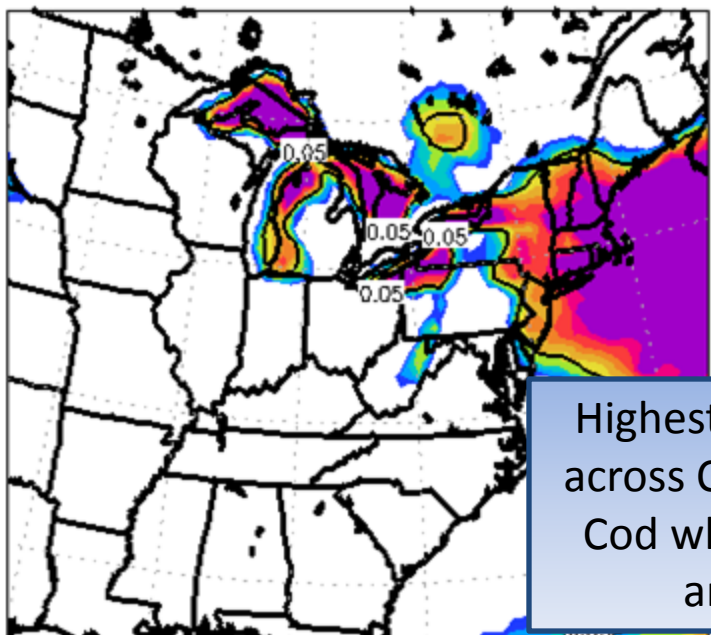
*This stresses the importance of "digging into the details" instead of solely looking at snowfall amounts when using CIPS analogs!*



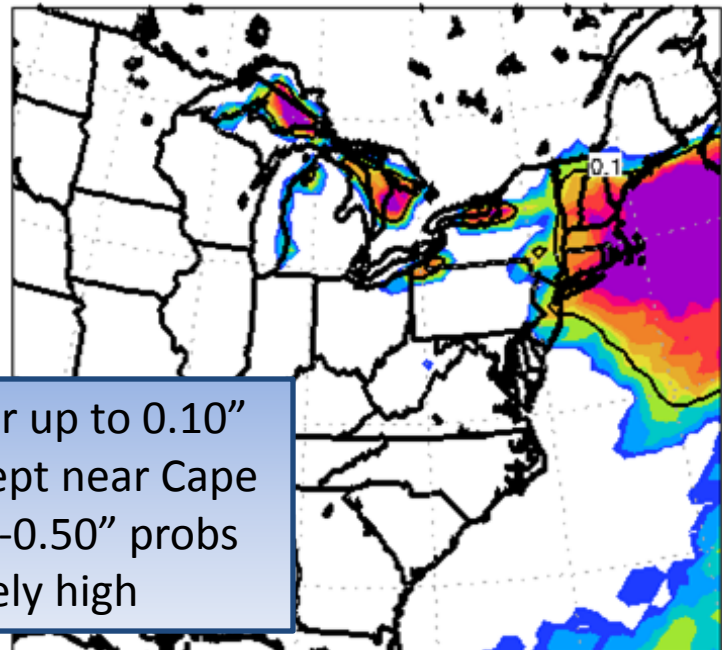


# SREF and HRRR Forecasts

a.15Z21JAN2013 SREFETA Prob of 0.05 apcpsfc in 12-hr  
Valid 00Z22JAN2013 to 12Z22JAN2013 Tue

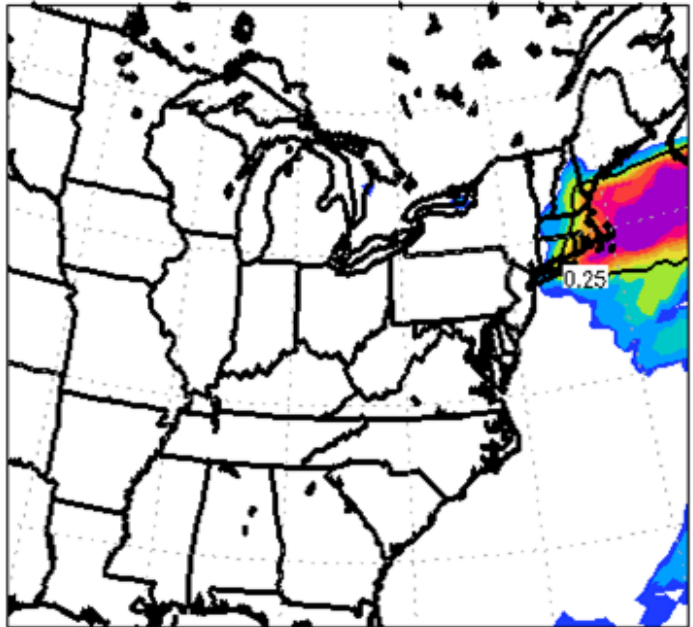


a.15Z21JAN2013 SREFETA Prob of 0.10 apcpsfc in 12-hr  
Valid 00Z22JAN2013 to 12Z22JAN2013 Tue

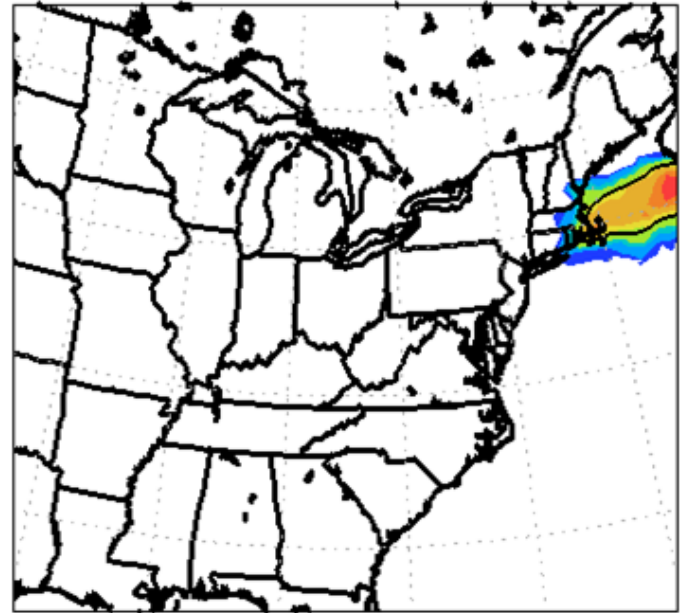


Highest probs for up to 0.10" across CWA, except near Cape Cod where 0.25-0.50" probs are relatively high

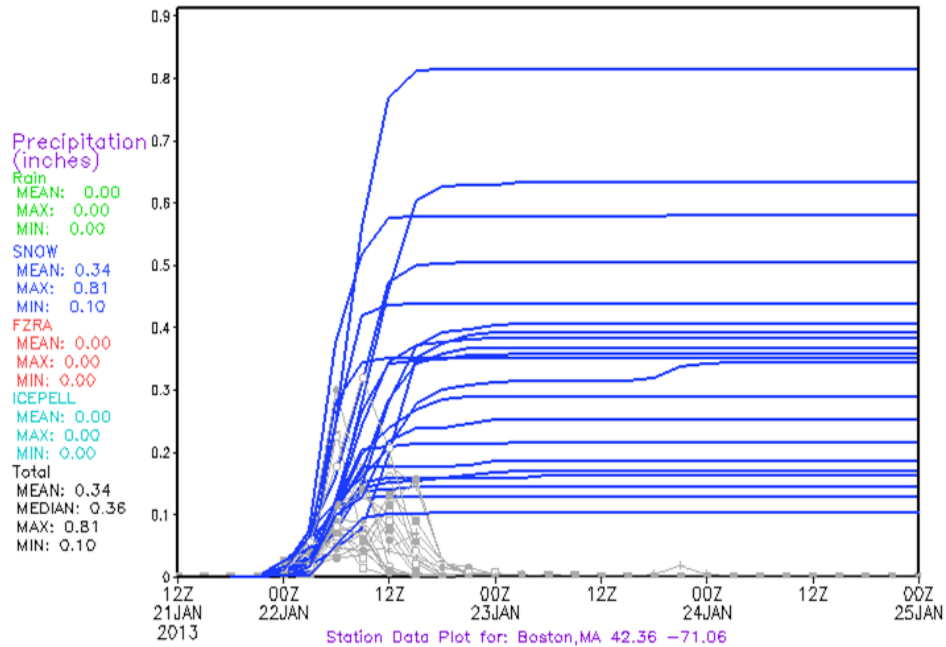
a.15Z21JAN2013 SREFETA Prob of 0.25 apcpsfc in 12-hr  
Valid 00Z22JAN2013 to 12Z22JAN2013 Tue



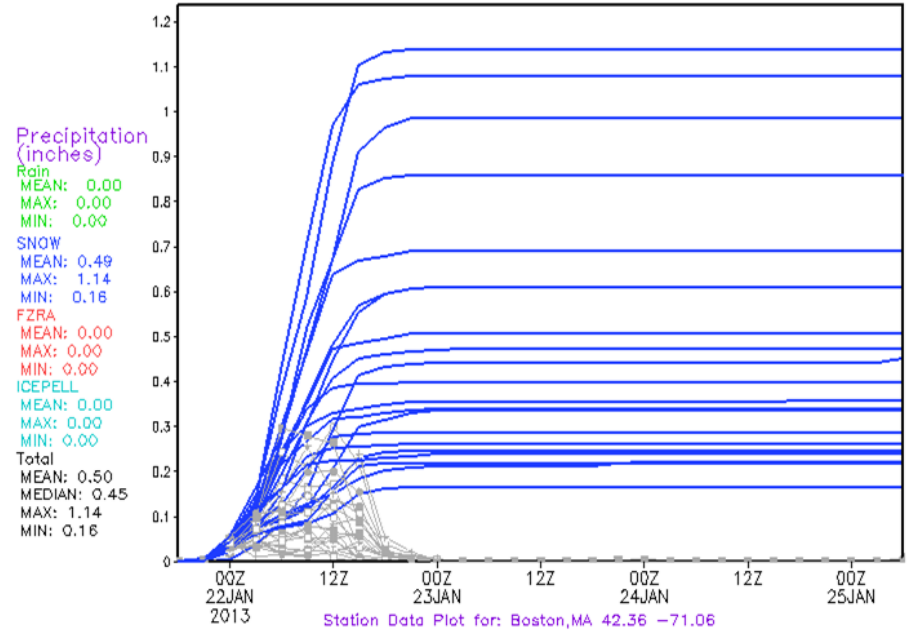
a.15Z21JAN2013 SREFETA Prob of 0.50 apcpsfc in 12-hr  
Valid 00Z22JAN2013 to 12Z22JAN2013 Tue



SREF Ensemble Member Forecast Initialized 09Z21JAN2013  
 Instantaneous 3 Hour Precip coded by EPS  
 Precip Accumulation(green:rain red:ice cyan:mix blue:snow)



SREF Ensemble Member Forecast Initialized 16Z21JAN2013  
 Instantaneous 3 Hour Precip coded by EPS  
 Precip Accumulation(green:rain red:ice cyan:mix blue:snow)



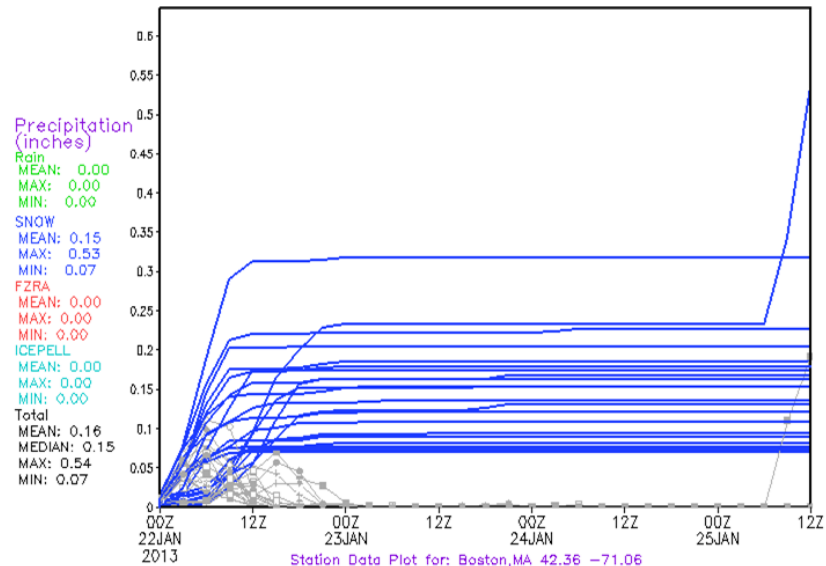
## SREF mean snowfall for BOS:

09z: 0.3 (0.1-0.8)

15z: 0.5 (0.2-1.1)

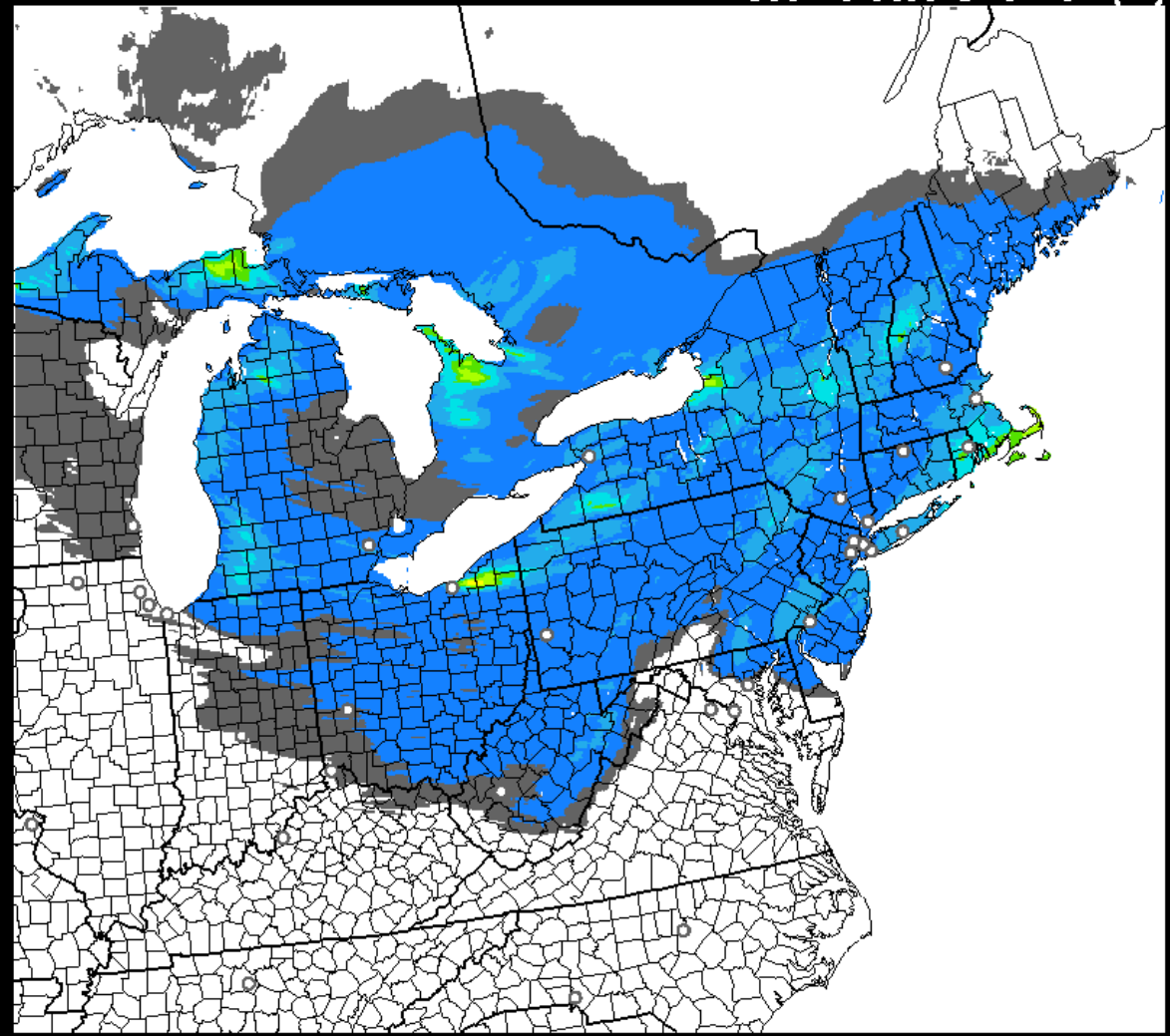
21z: 0.2 (0.1-0.5)

SREF Ensemble Member Forecast Initialized 21Z21JAN2013  
 Instantaneous 3 Hour Precip coded by EPS  
 Precip Accumulation(green:rain red:ice cyan:mix blue:snow)



HRRR 01/21/2013 (18:00) 15h fcst - Experimental

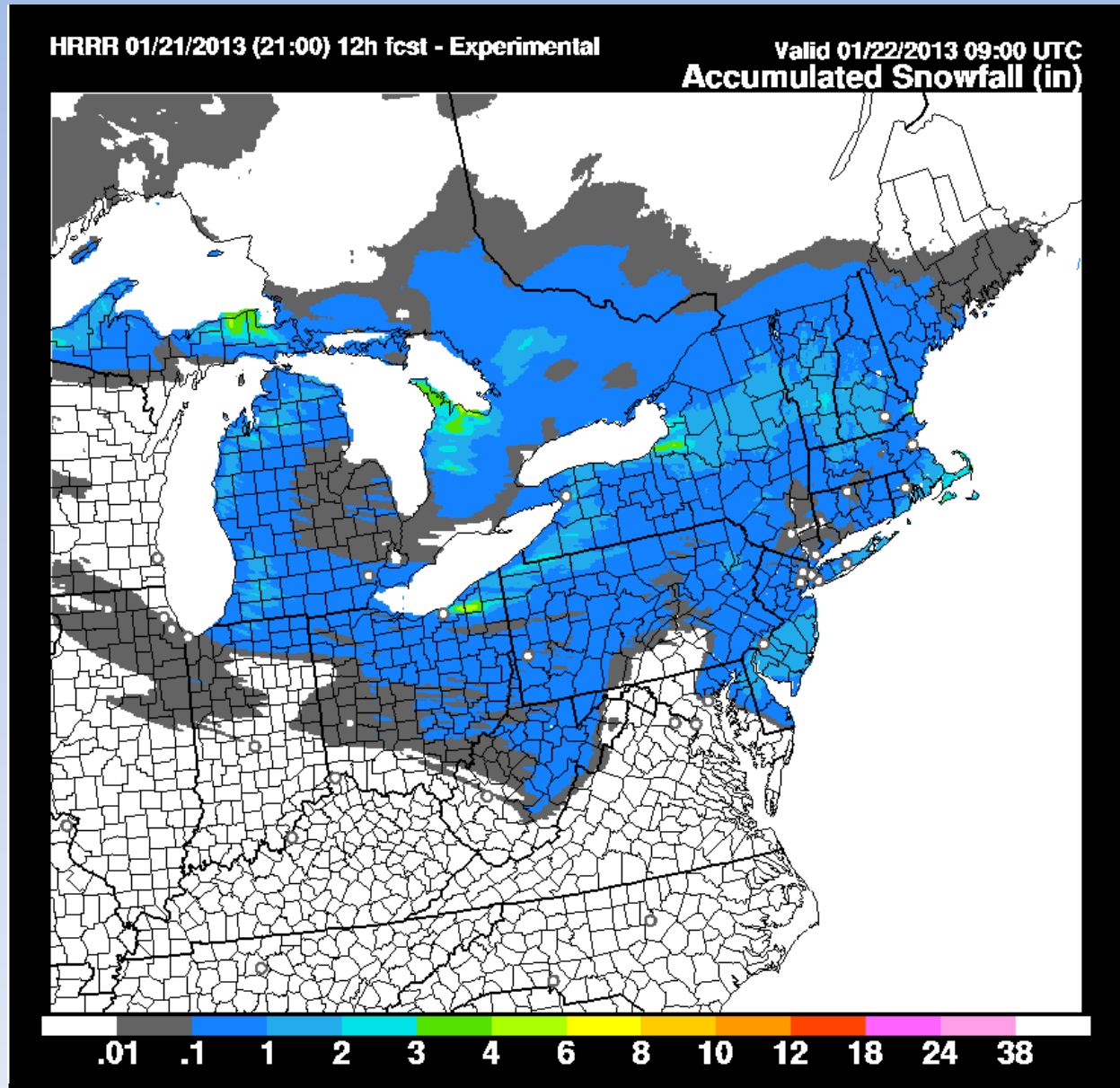
Valid 01/22/2013 09:00 UTC  
Accumulated Snowfall (in)



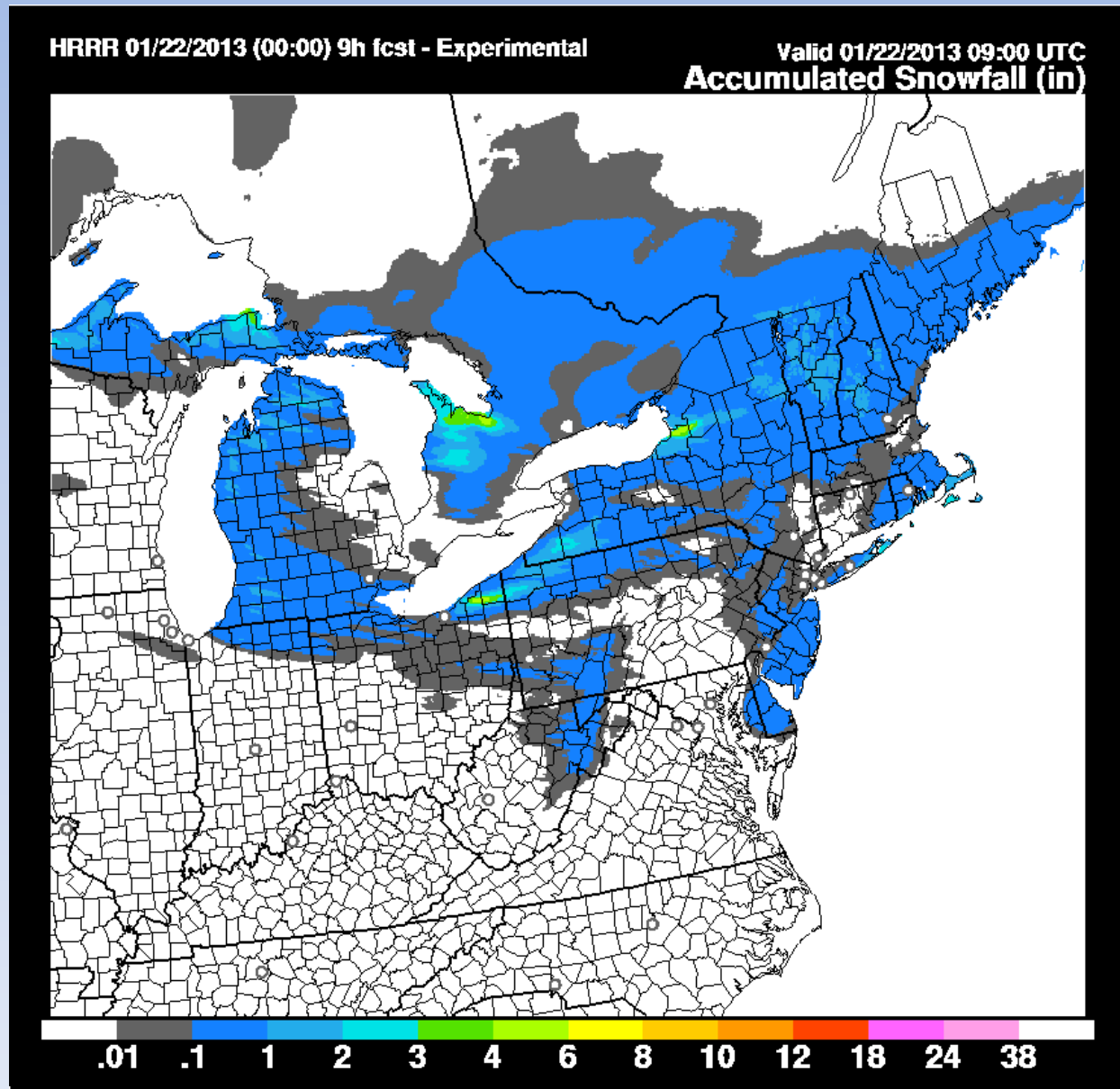
18z 1/21 HRRR  
shows max  
snowfall of 3-6"  
on Cape Cod and  
Islands

.01 .1 1 2 3 4 6 8 10 12 18 24 38

21z 1/21 HRRR  
backed off with  
max snowfall of  
1-3" on Cape Cod  
and Islands

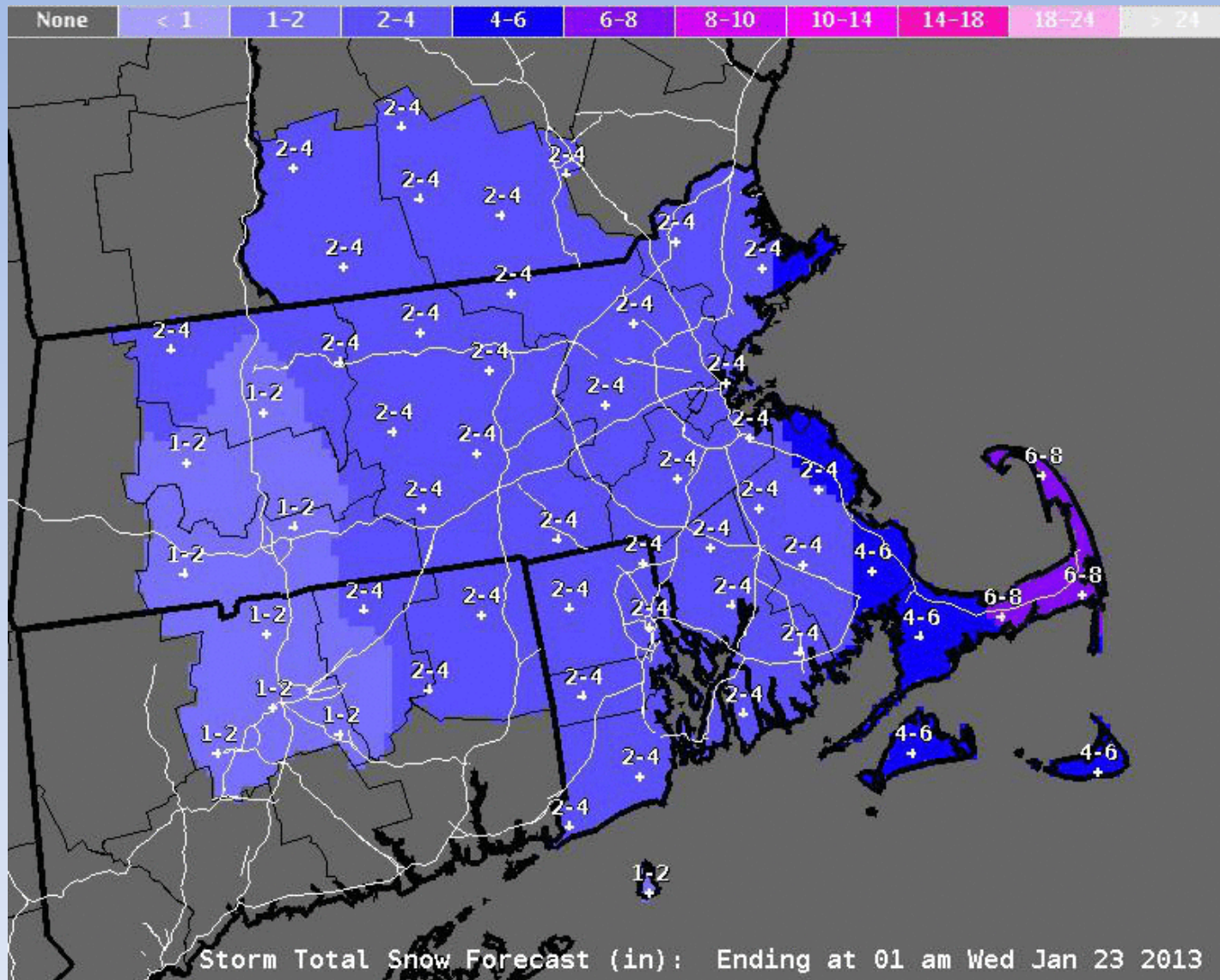


00z 1/22 HRRR  
backed off on  
areal coverage but  
still shows max  
snowfall of  
1-3" on Cape Cod  
and Islands



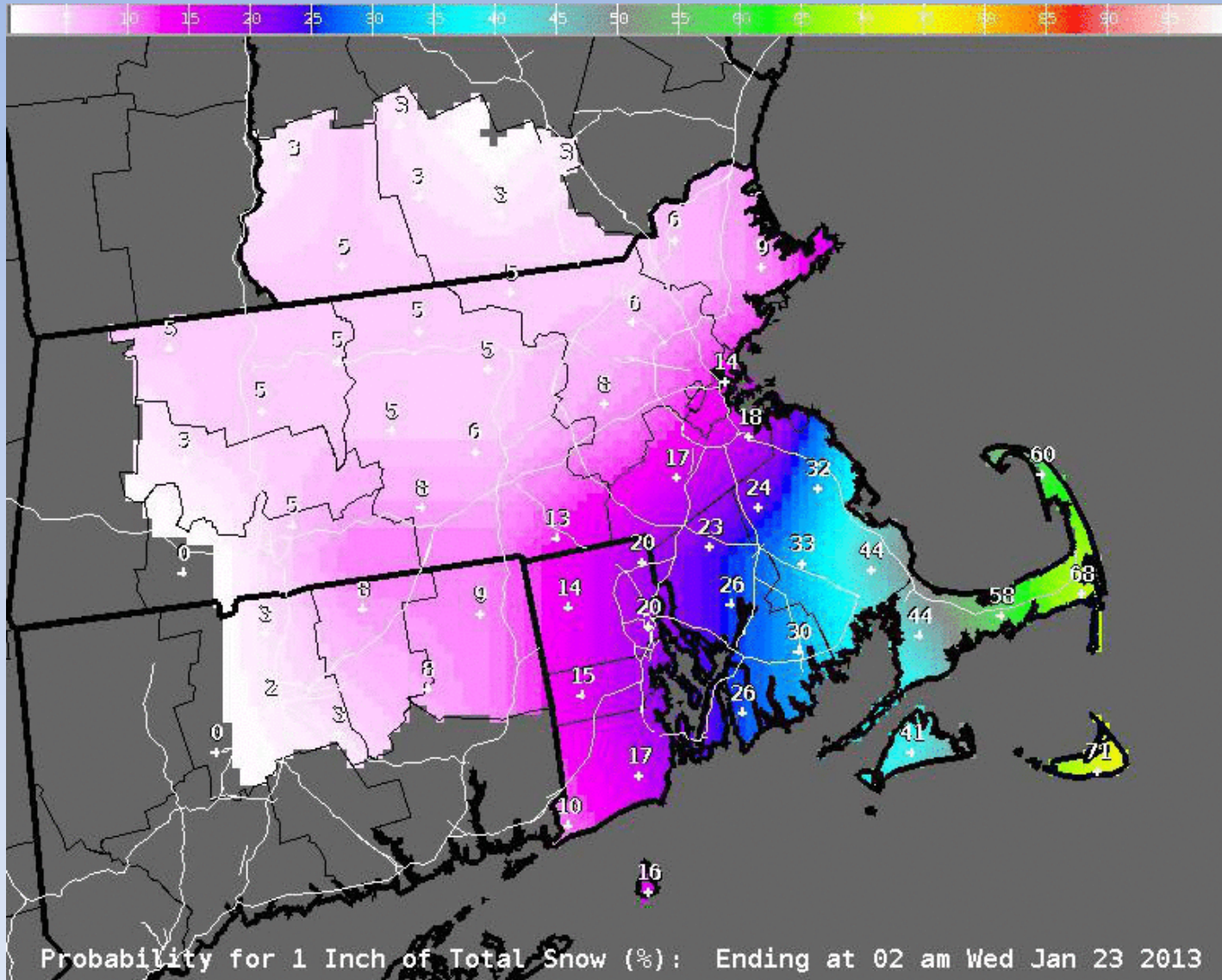
# WFO BOX Forecasts

# Deterministic Forecasts

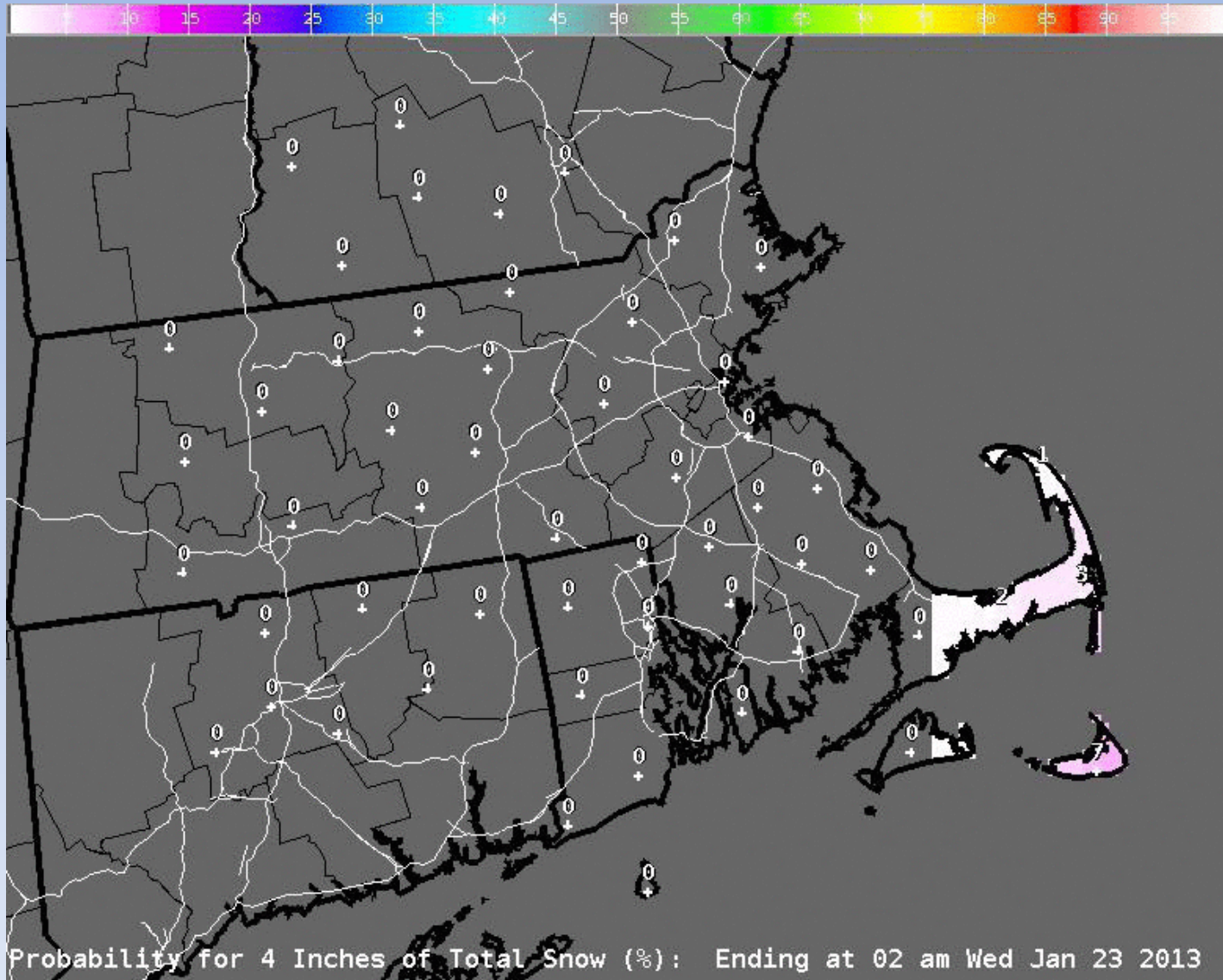




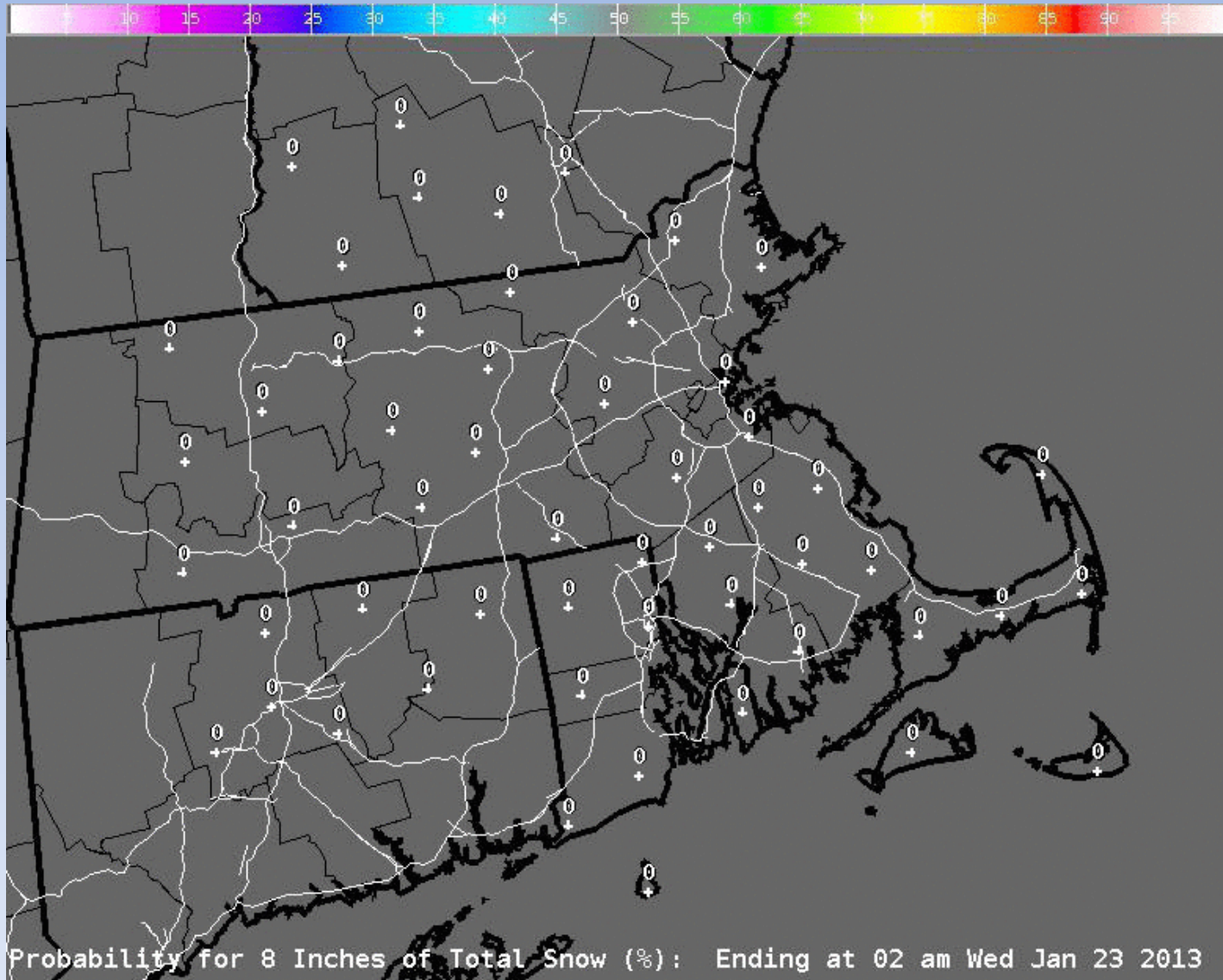
# Snow Probs: 1" or Greater



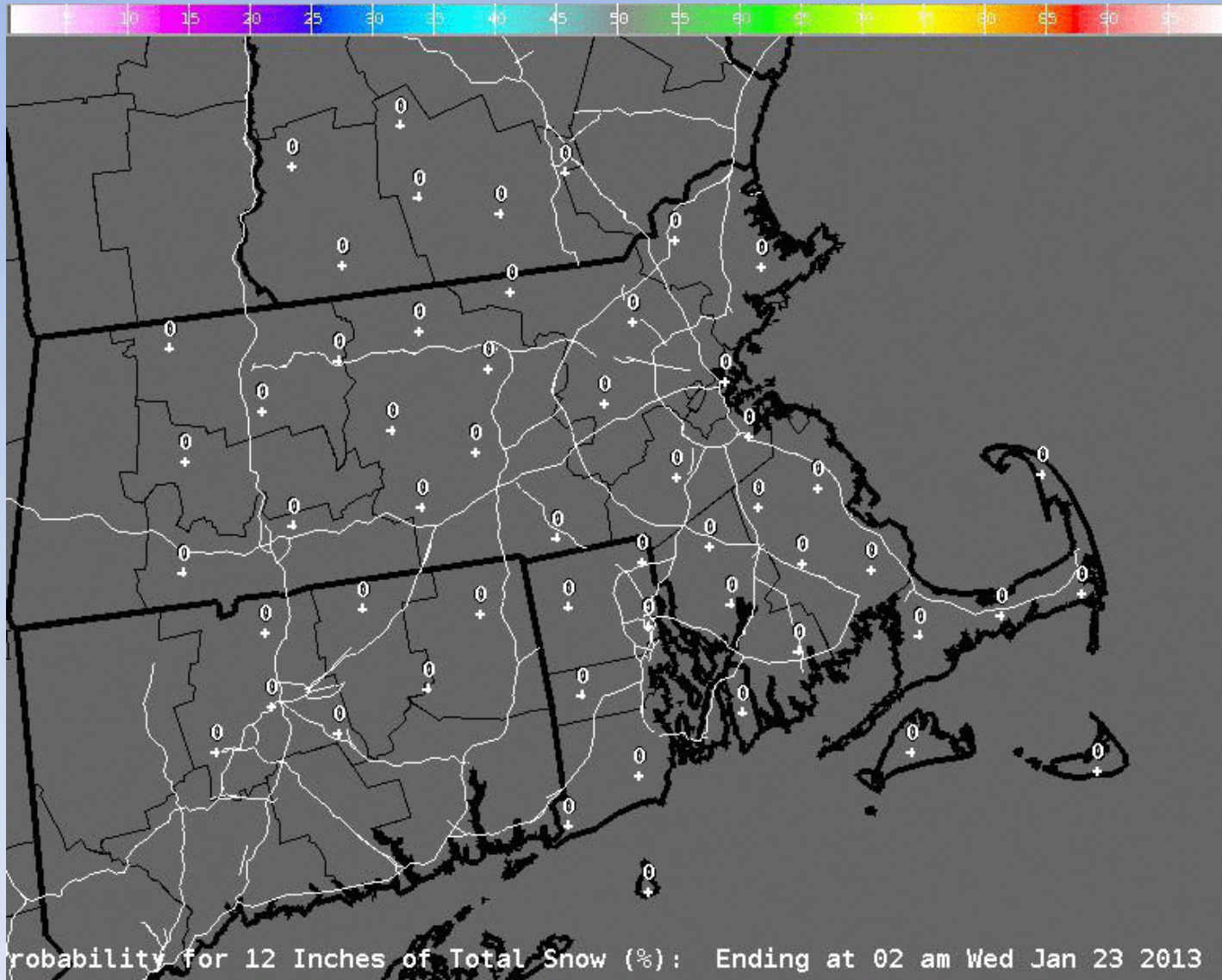
# Snow Probs: 4" or Greater



# Snow Probs: 8" or Greater



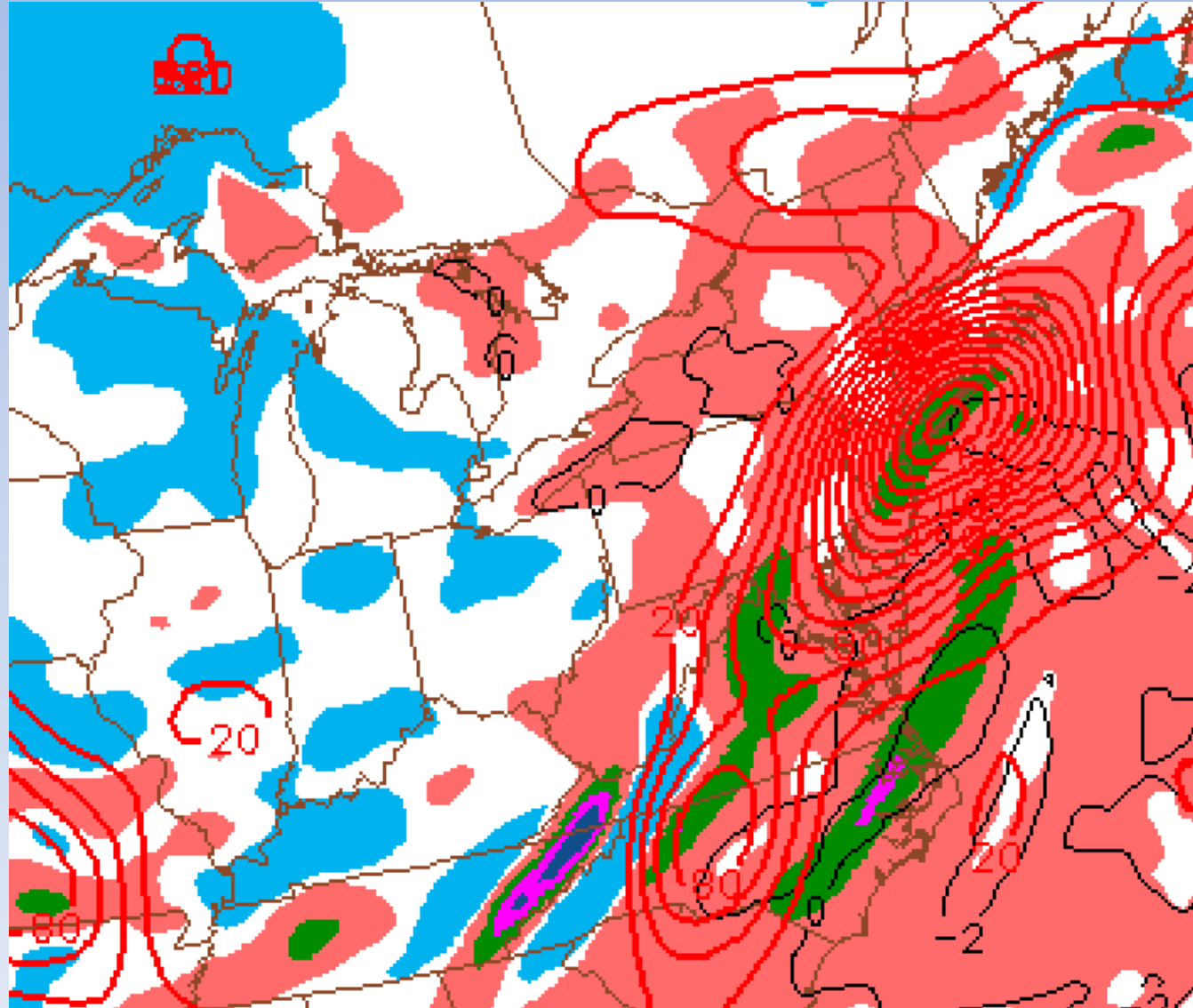
# Snow Probs: 12" or Greater



# Mesoscale Analysis

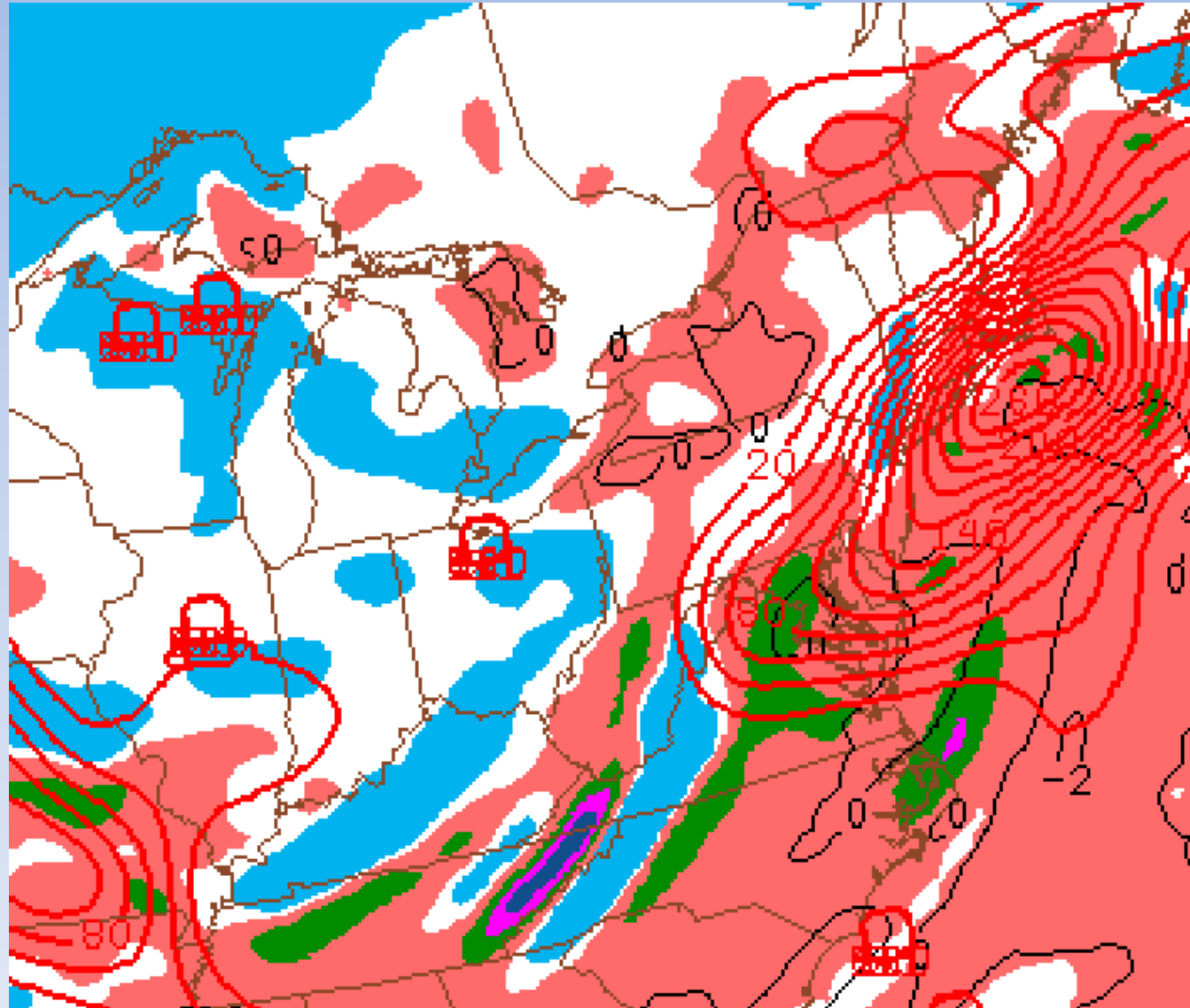
# 850 mb Frontogenesis and EPV

**02z Jan 22:**  
Collocated FGEN/  
-EPV over Long  
Island extending  
along the south  
coast



# 850 mb Frontogenesis and EPV

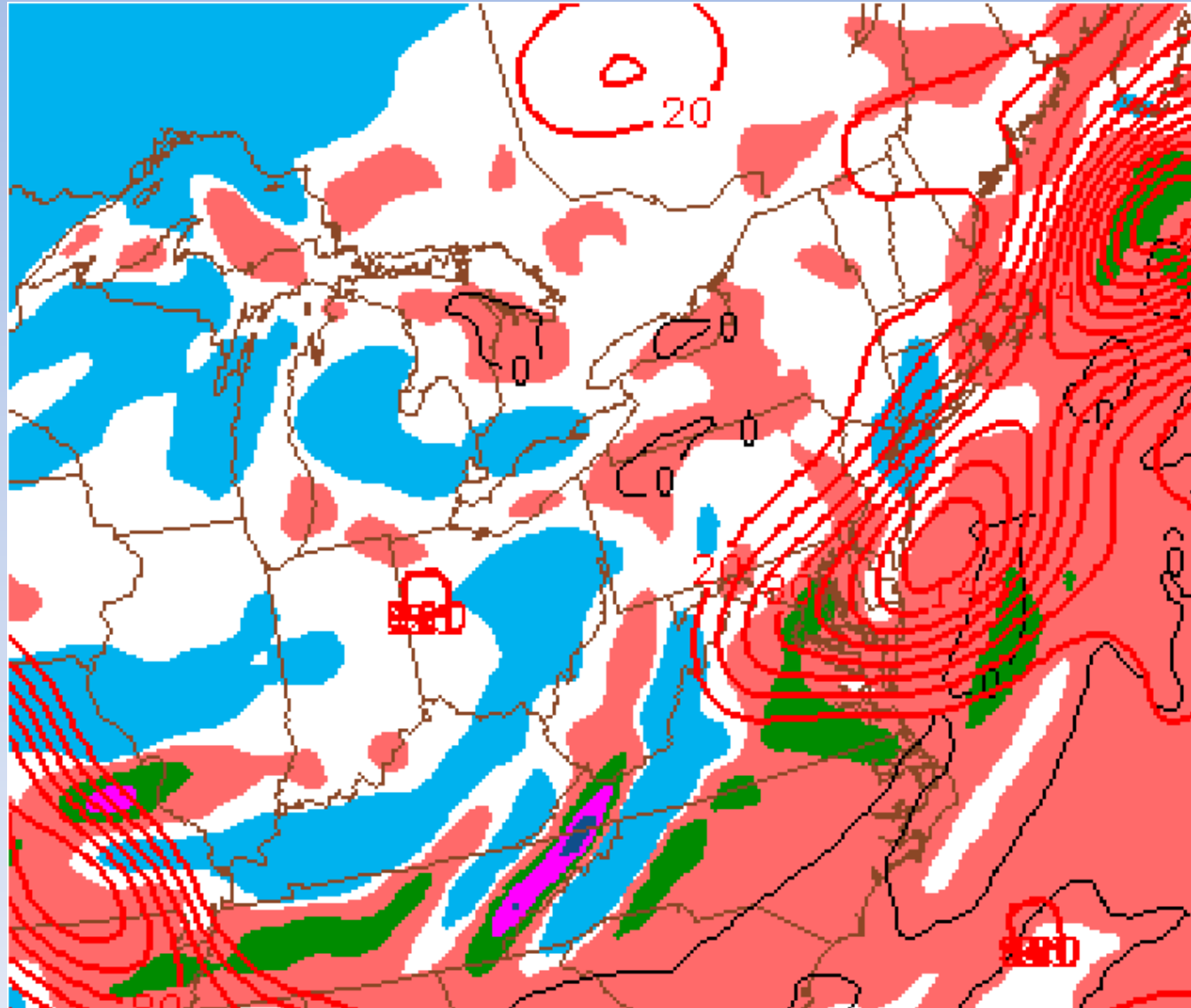
**04z Jan 22:**  
FGEN/-EPV shifts  
northeast with axis  
south of New  
England



# 850 mb Frontogenesis and EPV

**06z Jan 22:**

Initial FGEN/-EPV shifts into Gulf of Maine, while second max develops off NJ coast

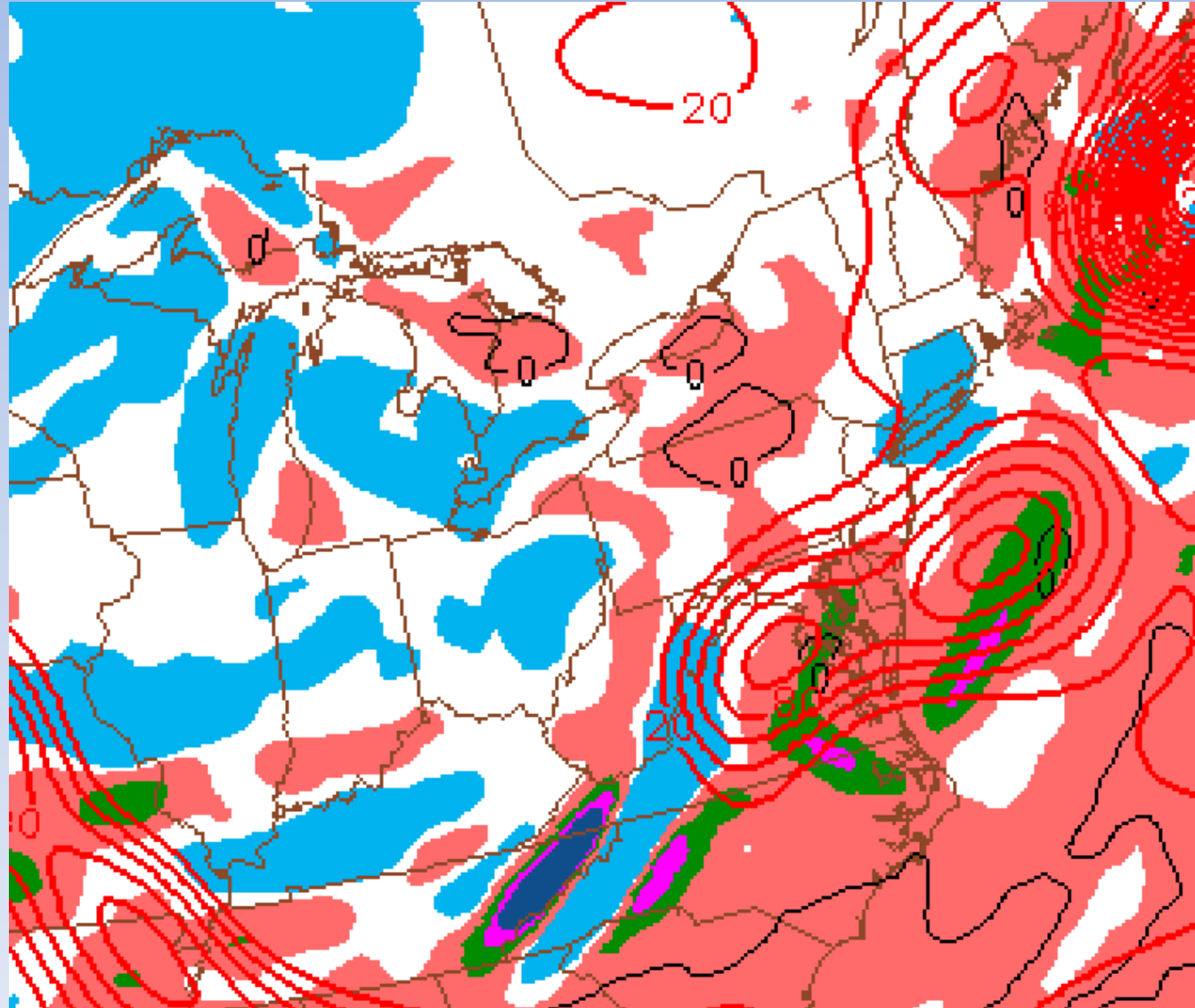




# 850 mb Frontogenesis and EPV

**08z Jan 22:**

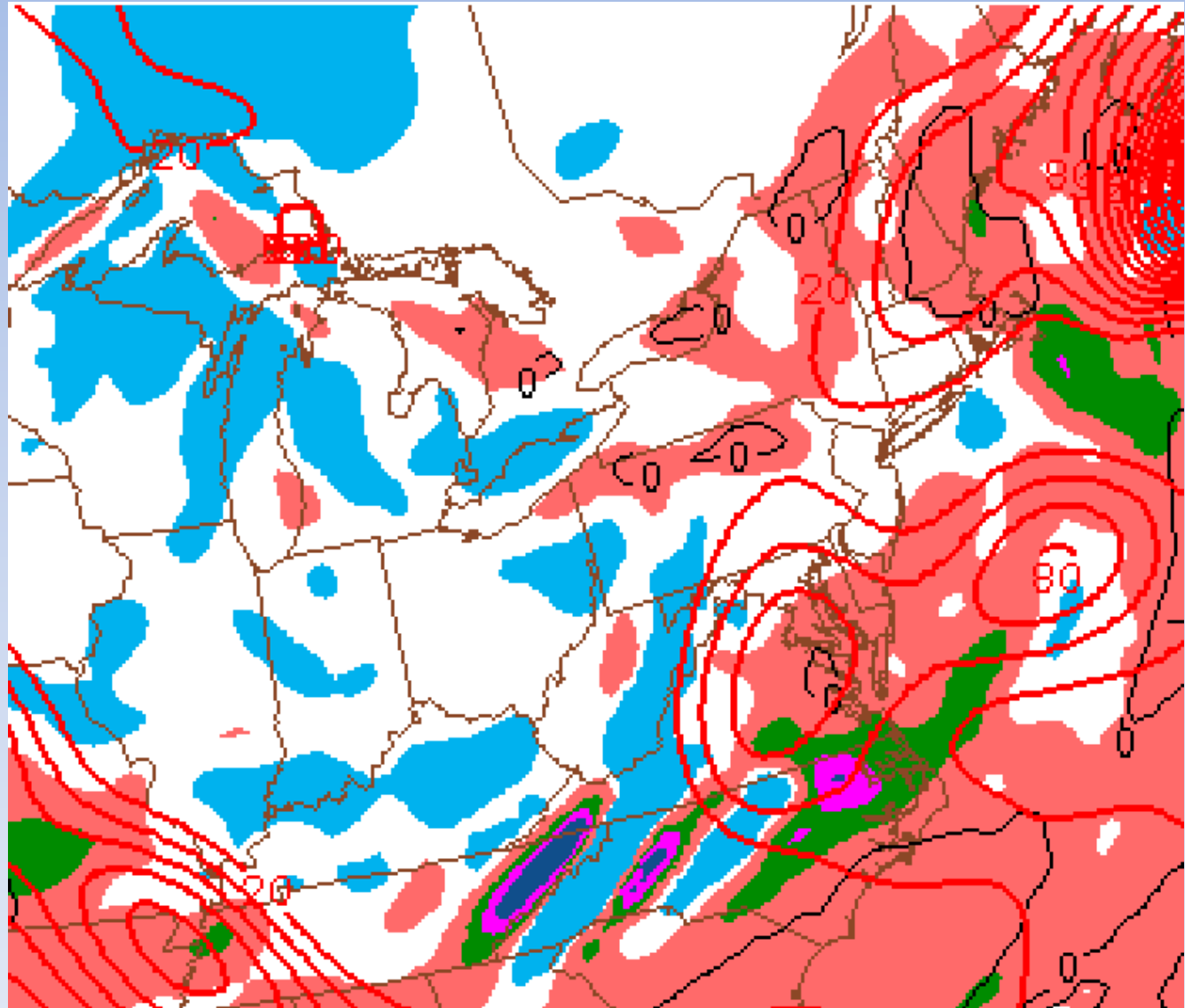
Second max remains well south of New England; only weak FGGEN remains



# 850 mb Frontogenesis and EPV

**10z Jan 22:**

Weak FGEN remains over New England, but it's "Game Over" for the CWA!



# Summary

- “Norlun Trough” materialized but precipitation was focused too far offshore
  - Surface low tracked outside 40/70 and deepened more than modeled
  - Offshore track allowed dry air to move in at mid levels
  - Strongest FGEN/-EPV shifted offshore
- Closest CIPS analog (Feb 1990) was too robust with 8-14”
  - Higher mid level moisture in that event
  - Remember to “dig into the details”
- SREFs and HRRR were more reasonable in short term
- SPC Mesoanalysis captured near-term trends well and matched radar imagery