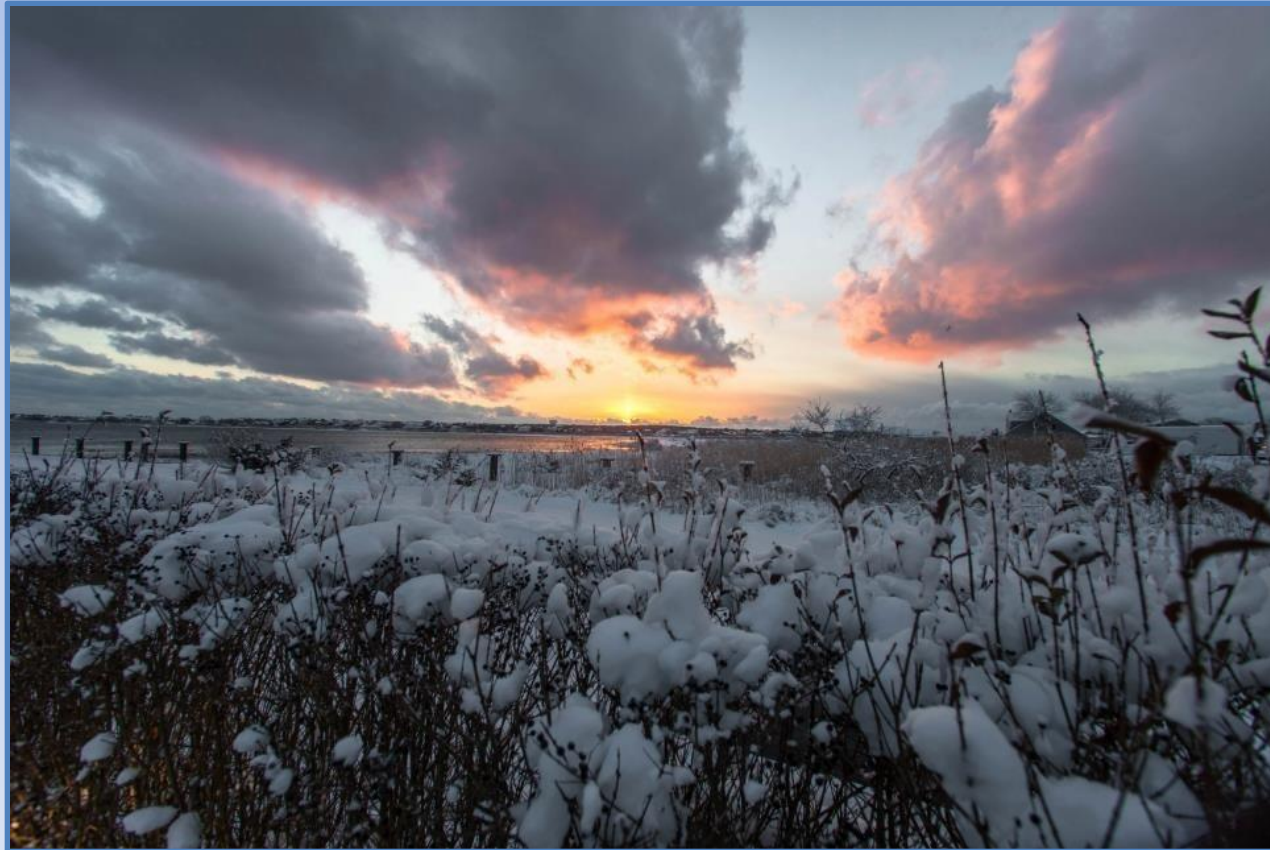
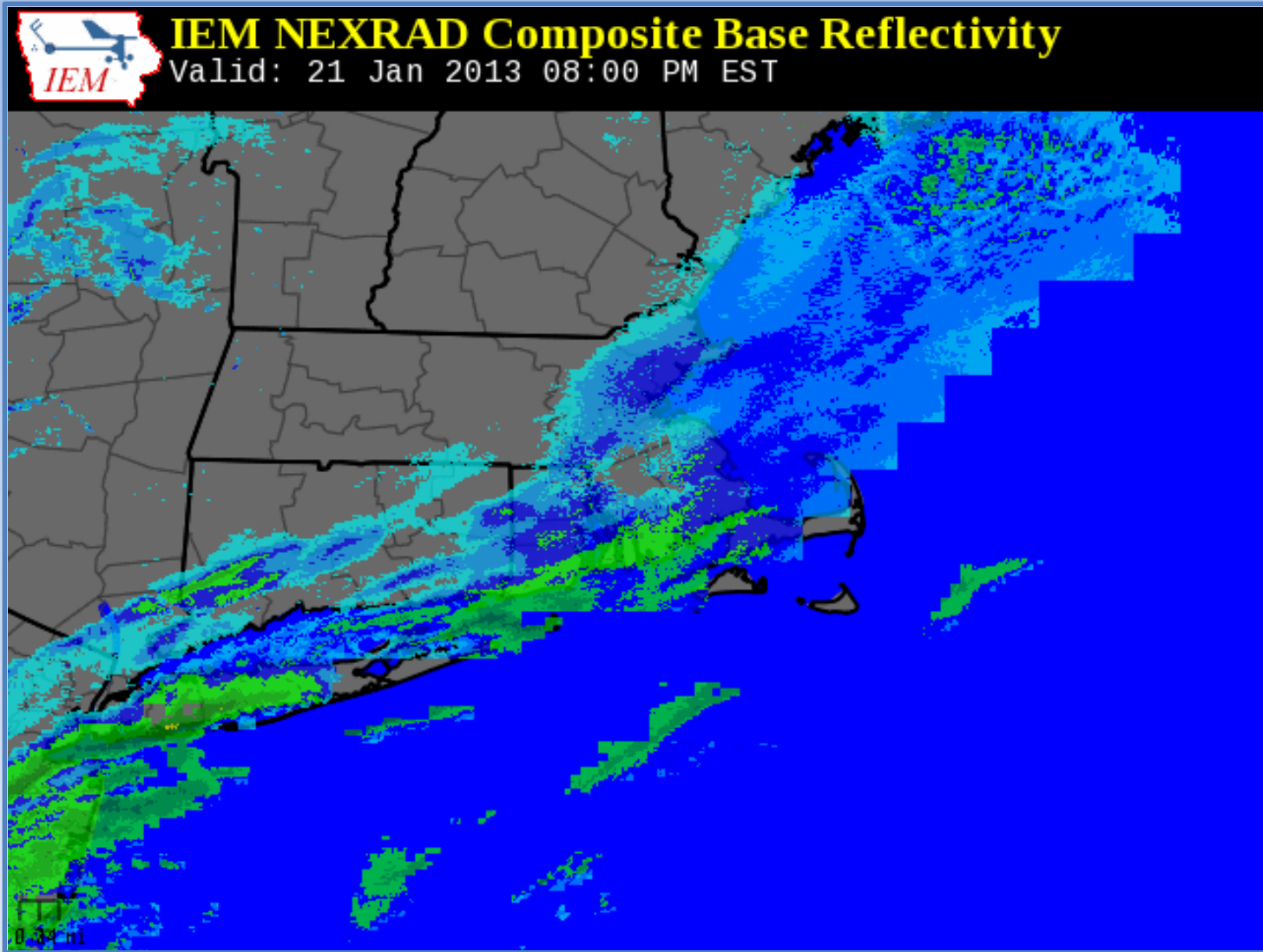


Event Review:
January 21-22, 2013
“Norlun Trough”



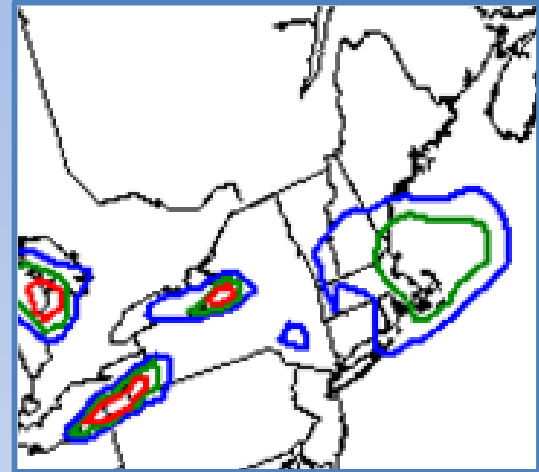
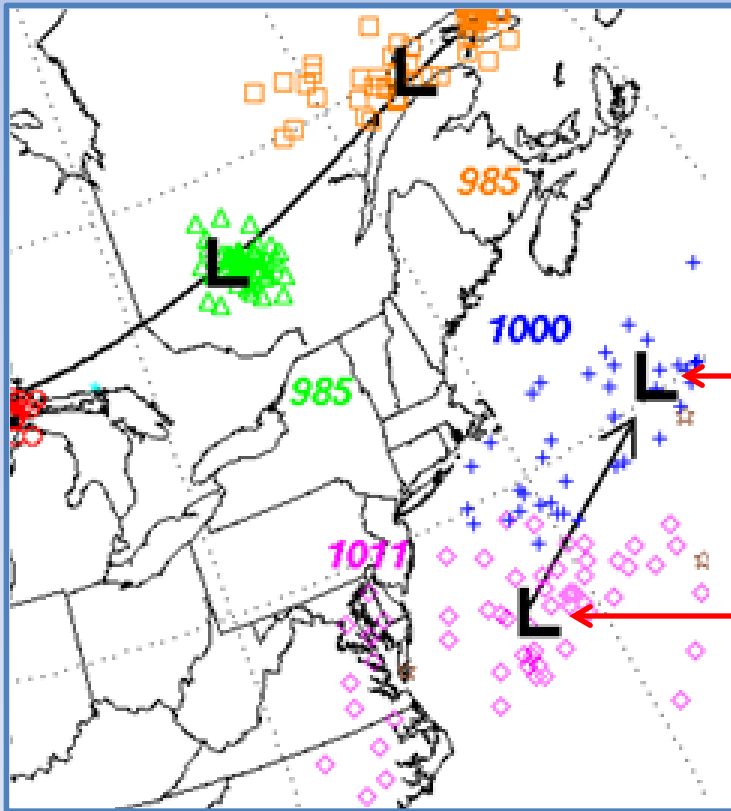
Nantucket, MA on January 22

What Happened

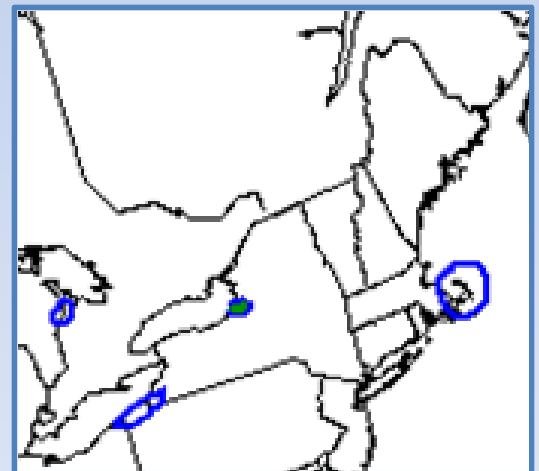


HPC Forecasts

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

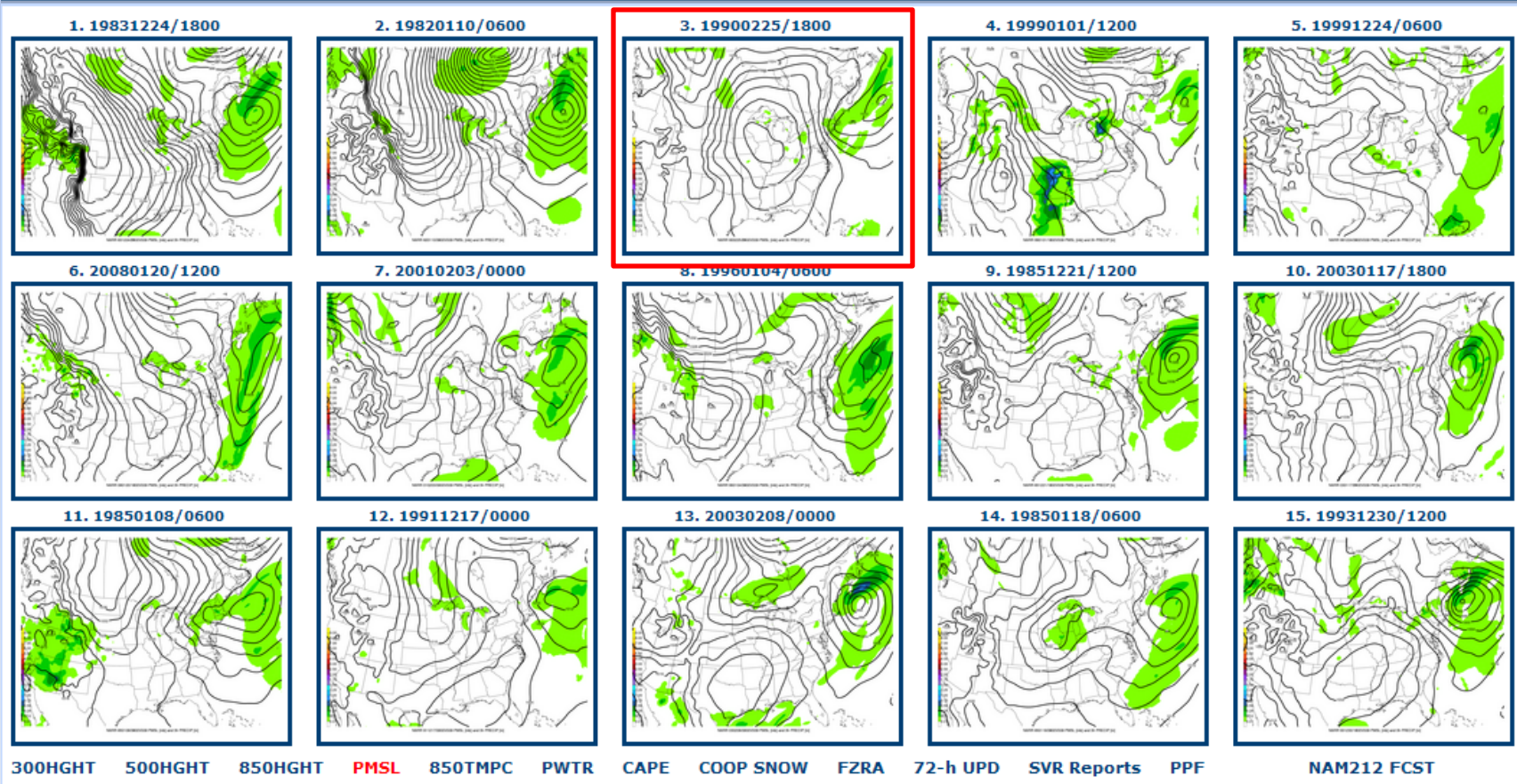


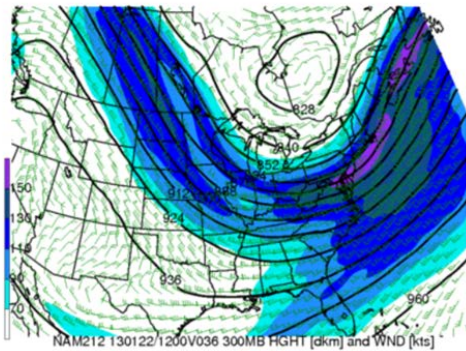
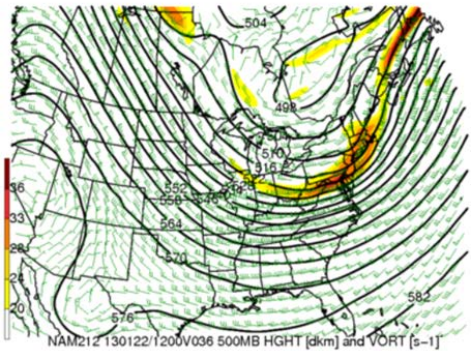
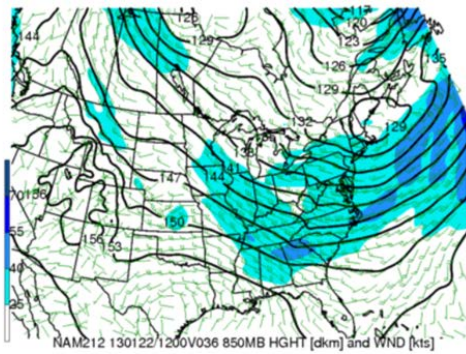
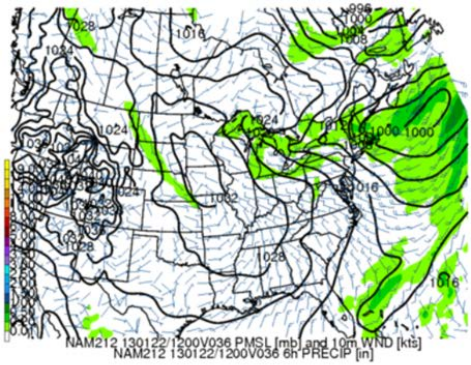
Probability of 8+ Inches

CIPS Analogs (F+36)

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

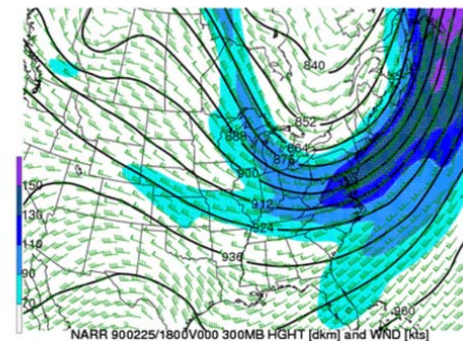
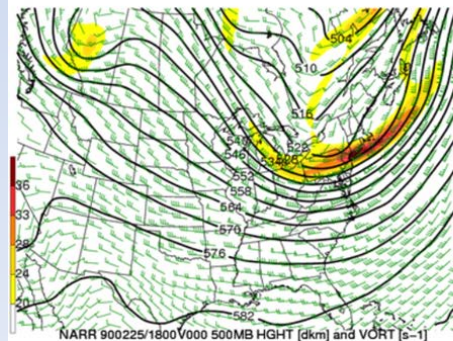
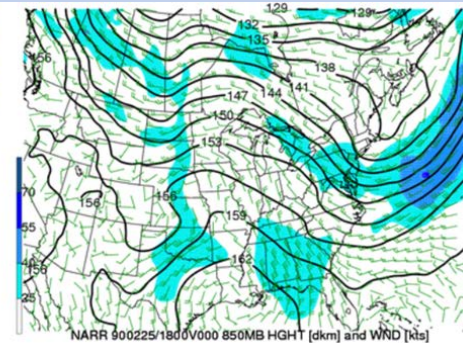
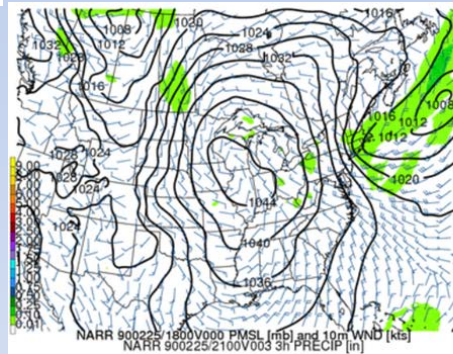
Analog Run: NAM212 20130121/0000F036 East Coast





January 22, 2013

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



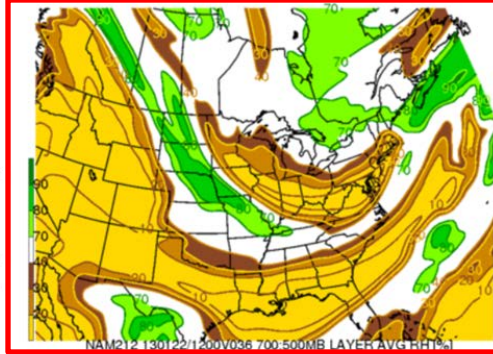
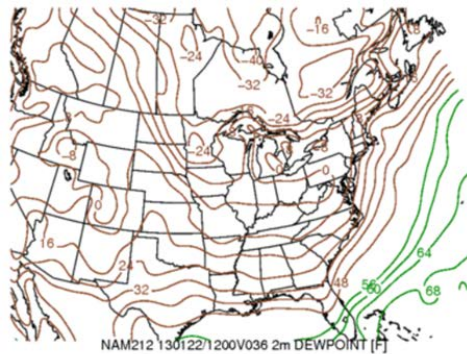
SFC

850 mb

500 mb

300 mb

February 25, 1990

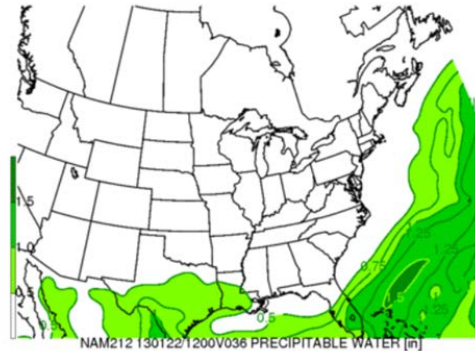
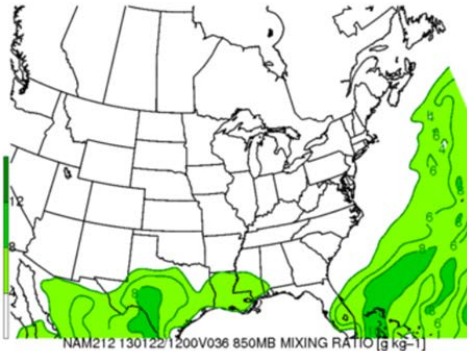


2m Dewpoint

700-500 mb RH

850 mb Mixing R

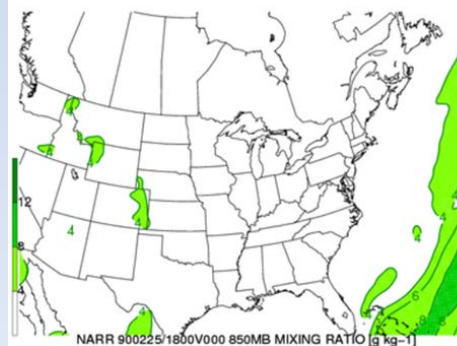
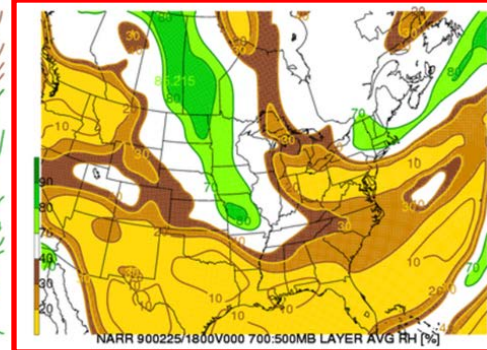
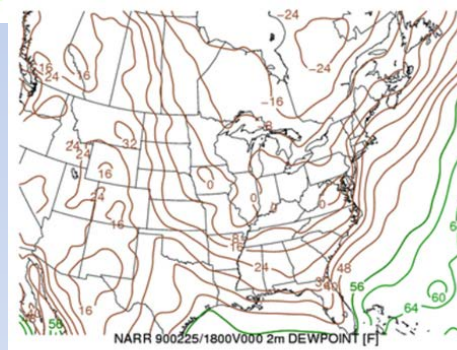
Precipitable Water

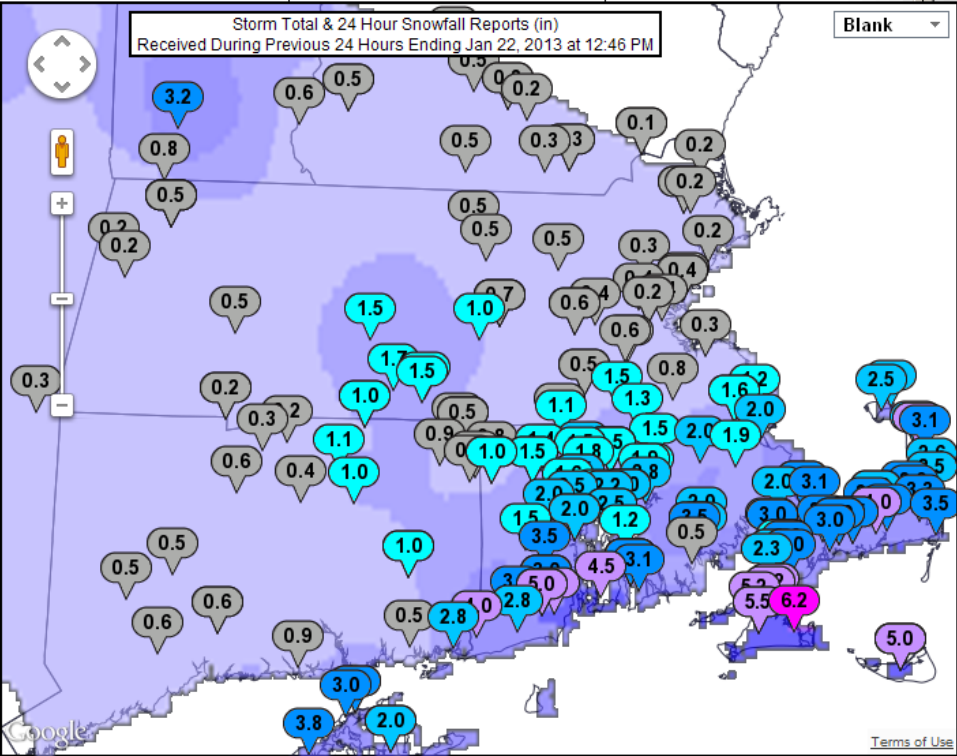


February 25, 1990

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!**



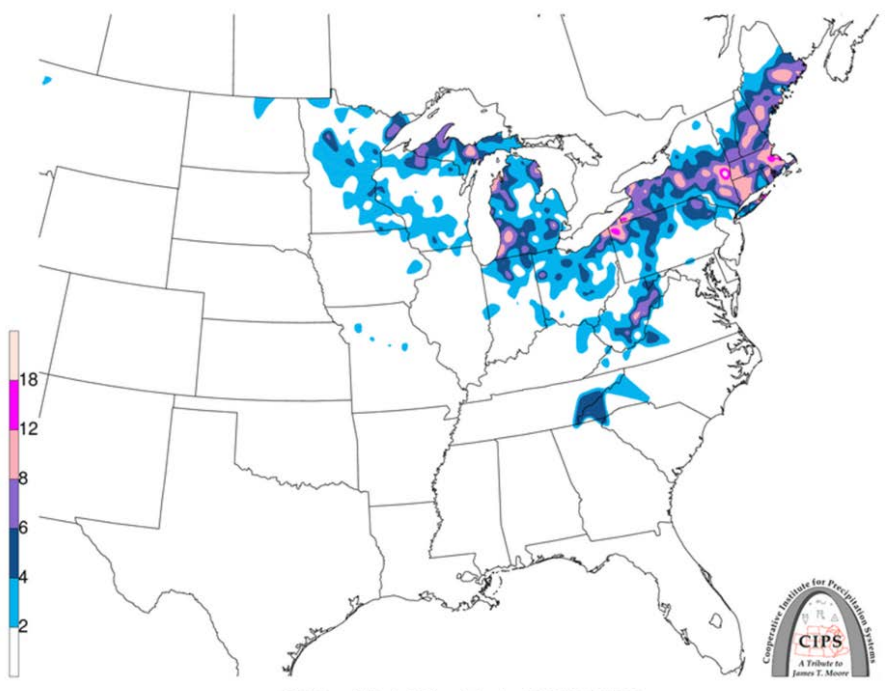


**January 22, 2013:
Max 3-6"**

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

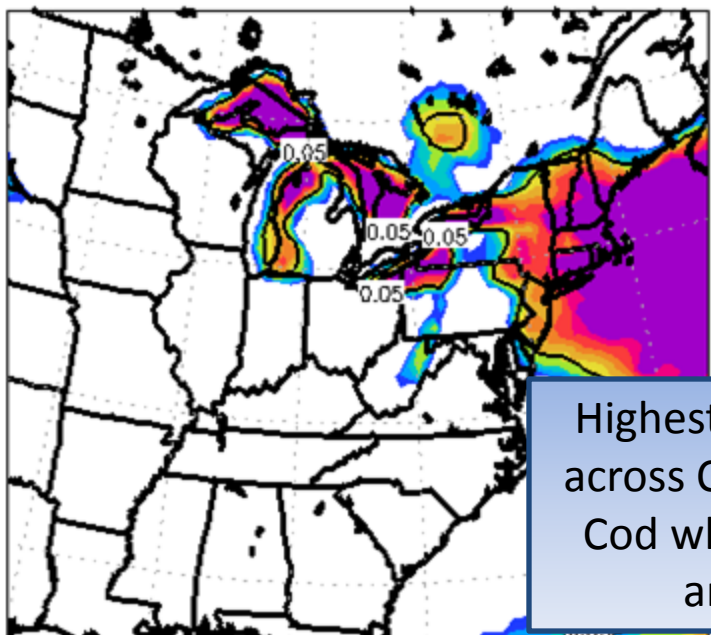
This stresses the importance of "digging into the details" instead of solely looking at snowfall amounts when using CIPS analogs!

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

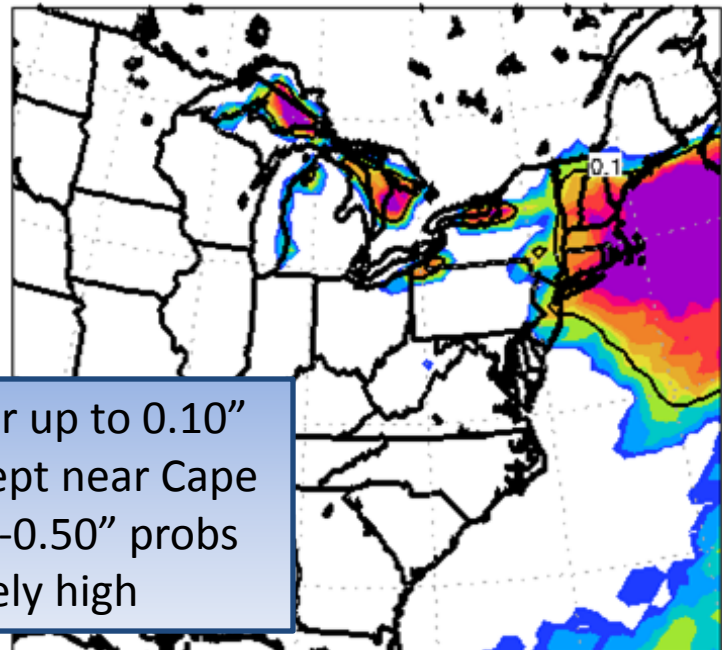


SREF and HRRR Forecasts

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

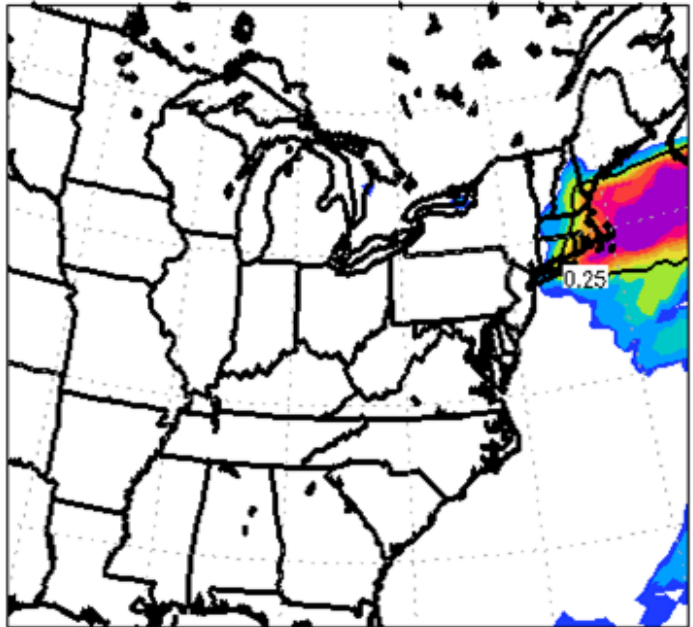


a.15Z21JAN2013 SREFETA Prob of 0.10 apcpsfc in 12-hr
Valid 00Z22JAN2013 to 12Z22JAN2013 Tue

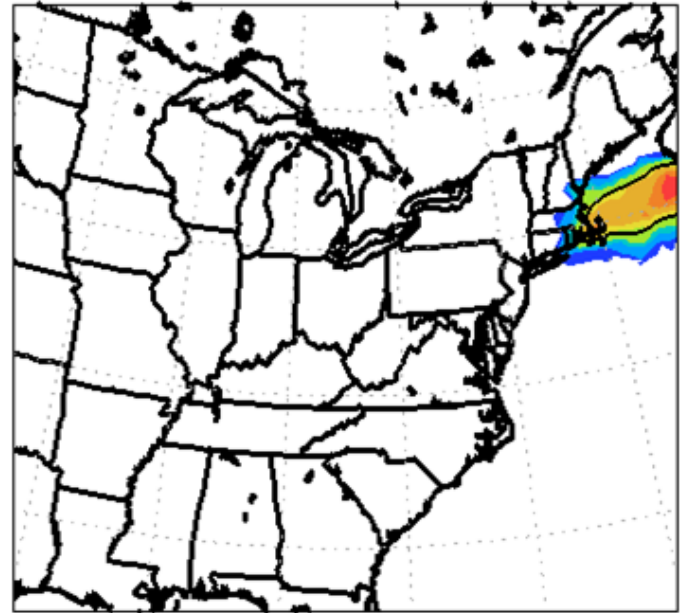


Highest probs for up to 0.10" across CWA, except near Cape Cod where 0.25-0.50" probs are relatively high

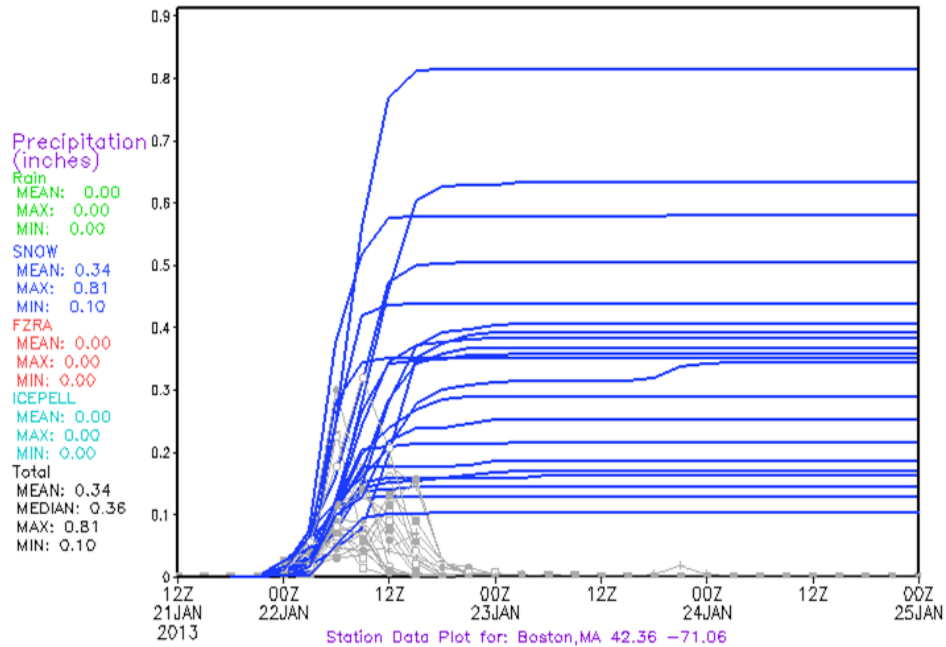
a.15Z21JAN2013 SREFETA Prob of 0.25 apcpsfc in 12-hr
Valid 00Z22JAN2013 to 12Z22JAN2013 Tue



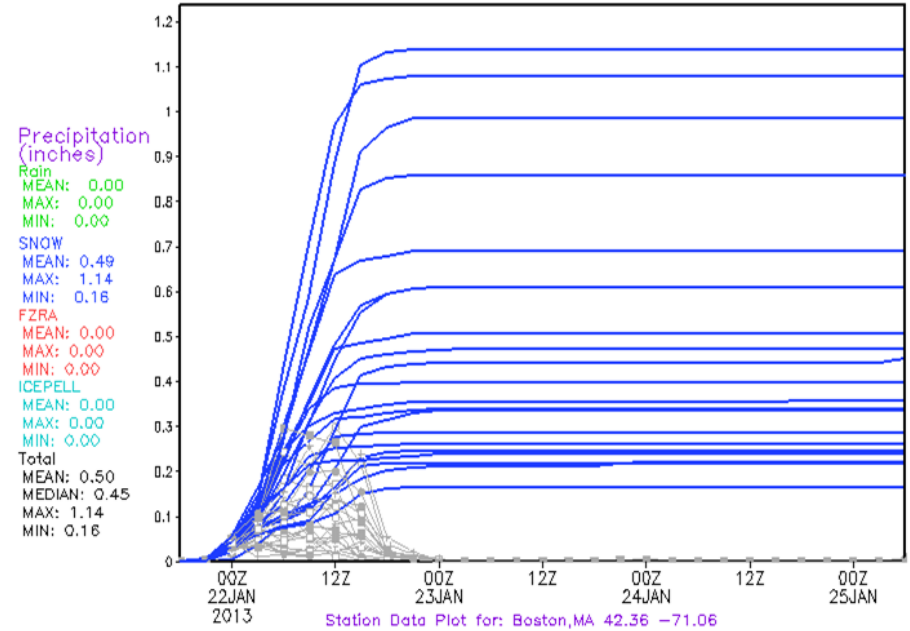
a.15Z21JAN2013 SREFETA Prob of 0.50 apcpsfc in 12-hr
Valid 00Z22JAN2013 to 12Z22JAN2013 Tue



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)



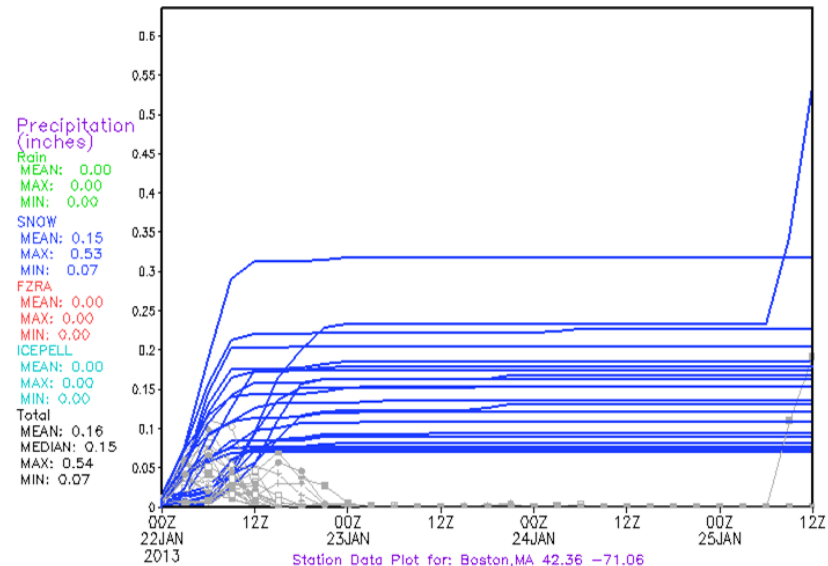
SREF mean snowfall for BOS:

09z: 0.3 (0.1-0.8)

15z: 0.5 (0.2-1.1)

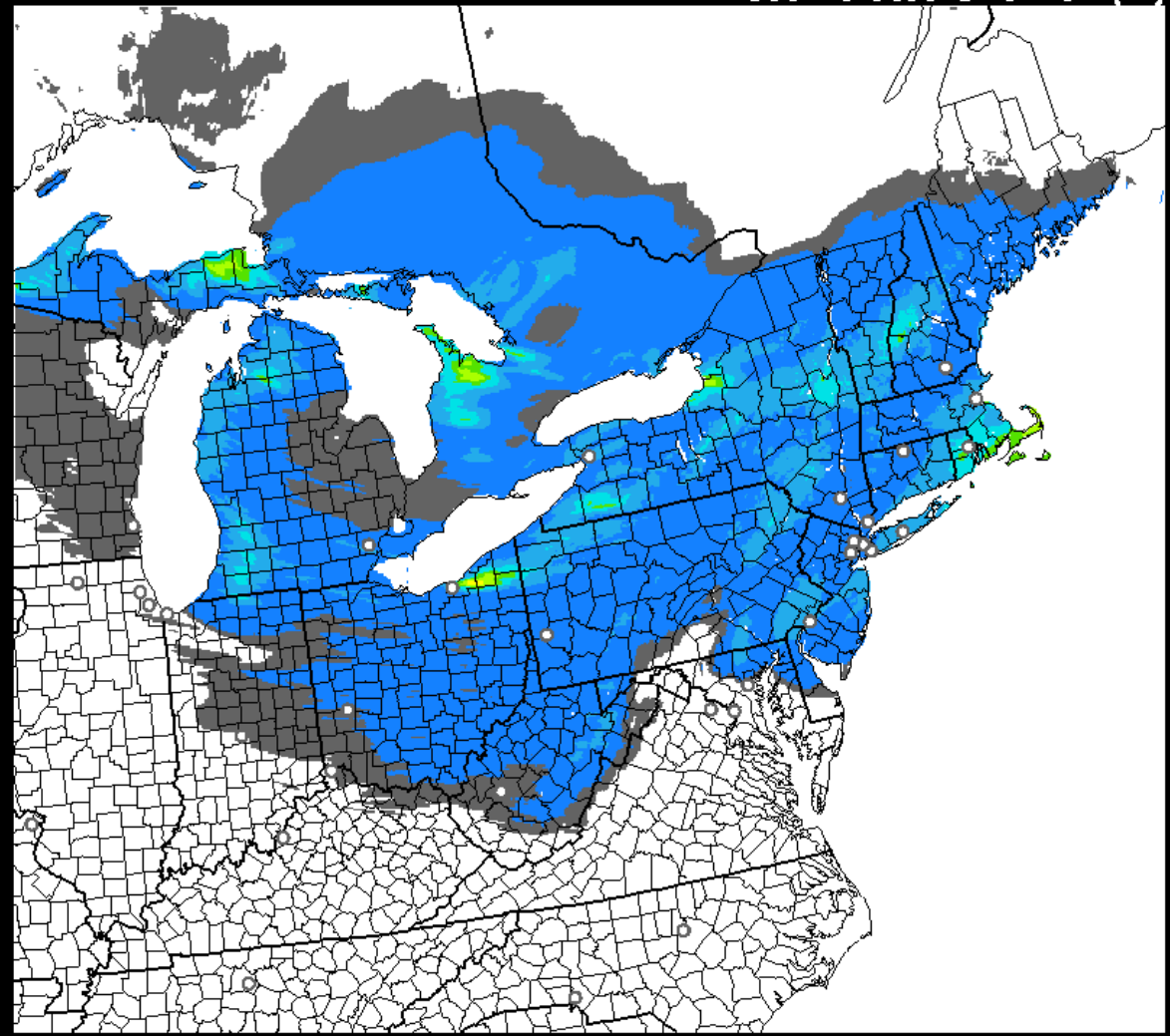
21z: 0.2 (0.1-0.5)

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

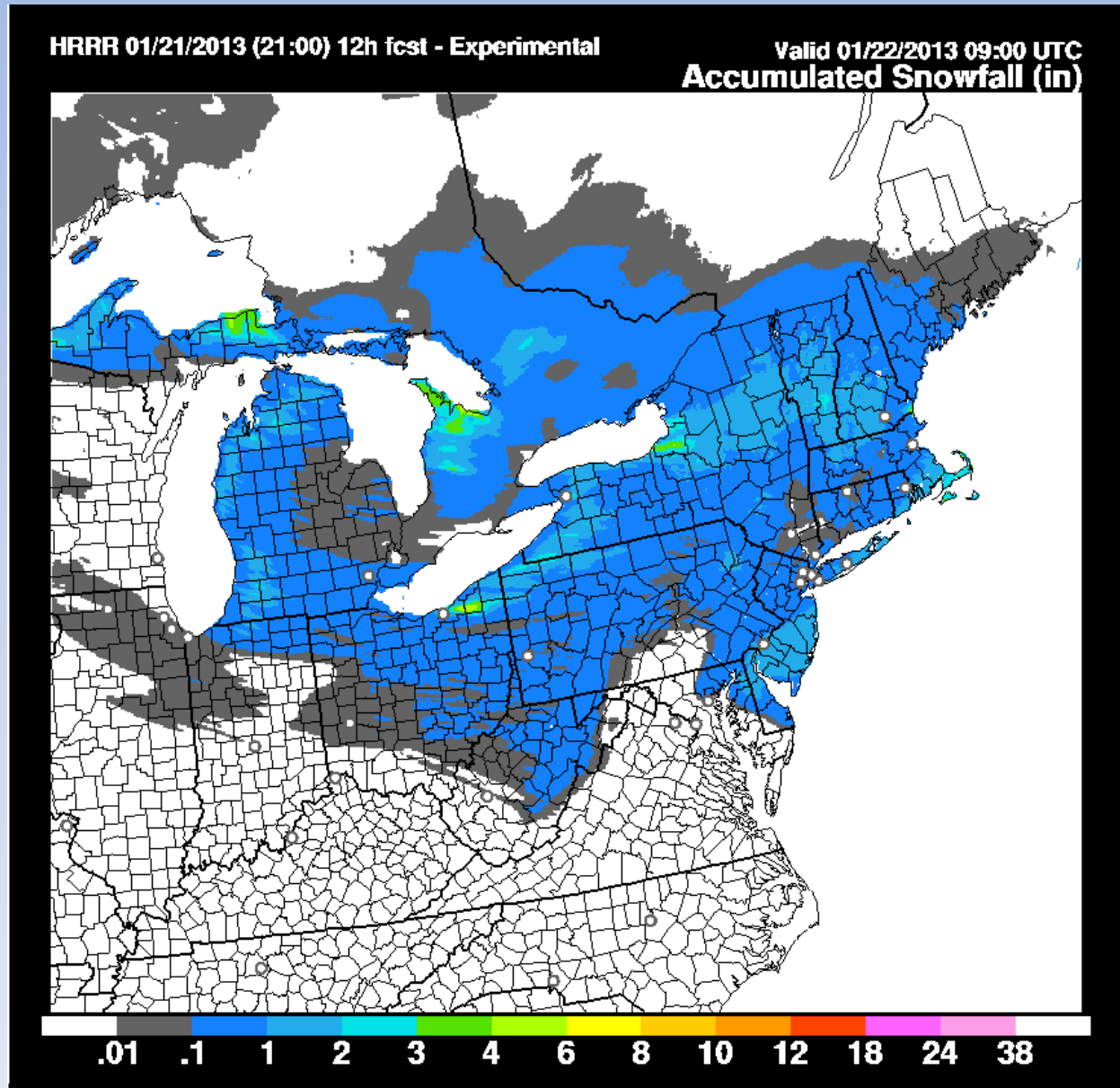
Valid 01/22/2013 09:00 UTC
Accumulated Snowfall (in)



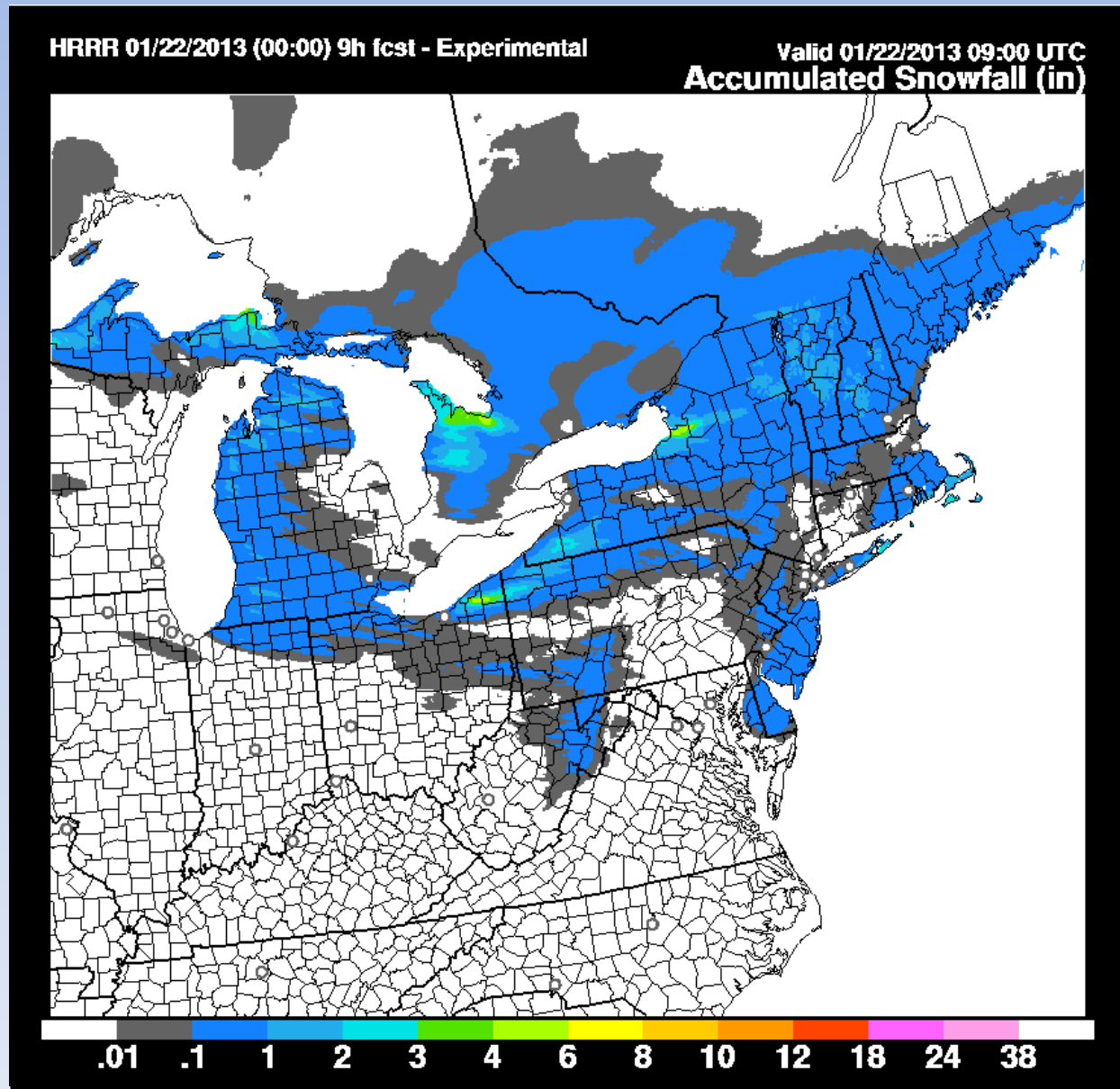
18z 1/21 HRRR
shows max
snowfall of 3-6"
on Cape Cod and
Islands

.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

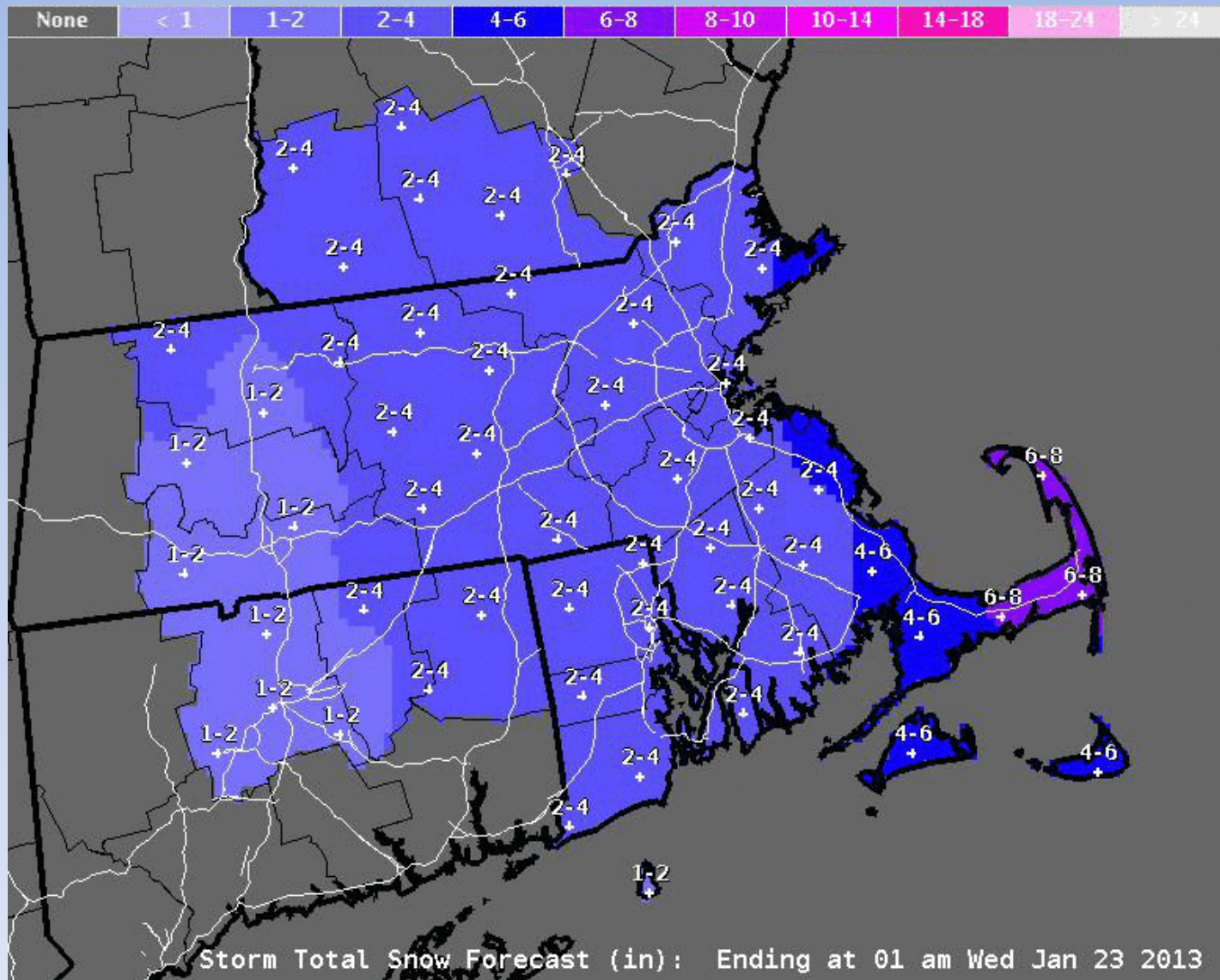


00z 1/22 HRRR
backed off on
areal coverage but
still shows max
snowfall of
1-3" on Cape Cod
and Islands

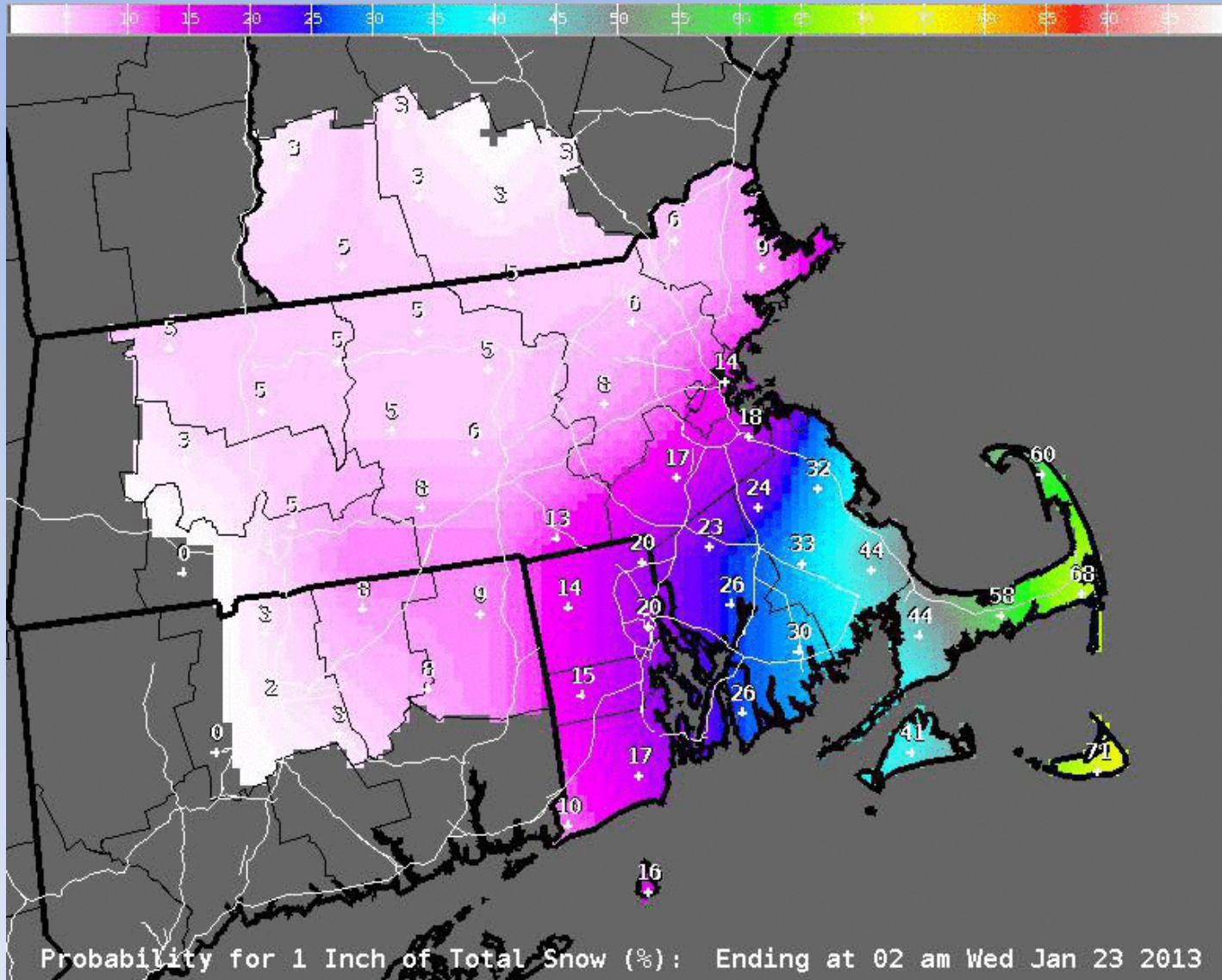


WFO BOX Forecasts

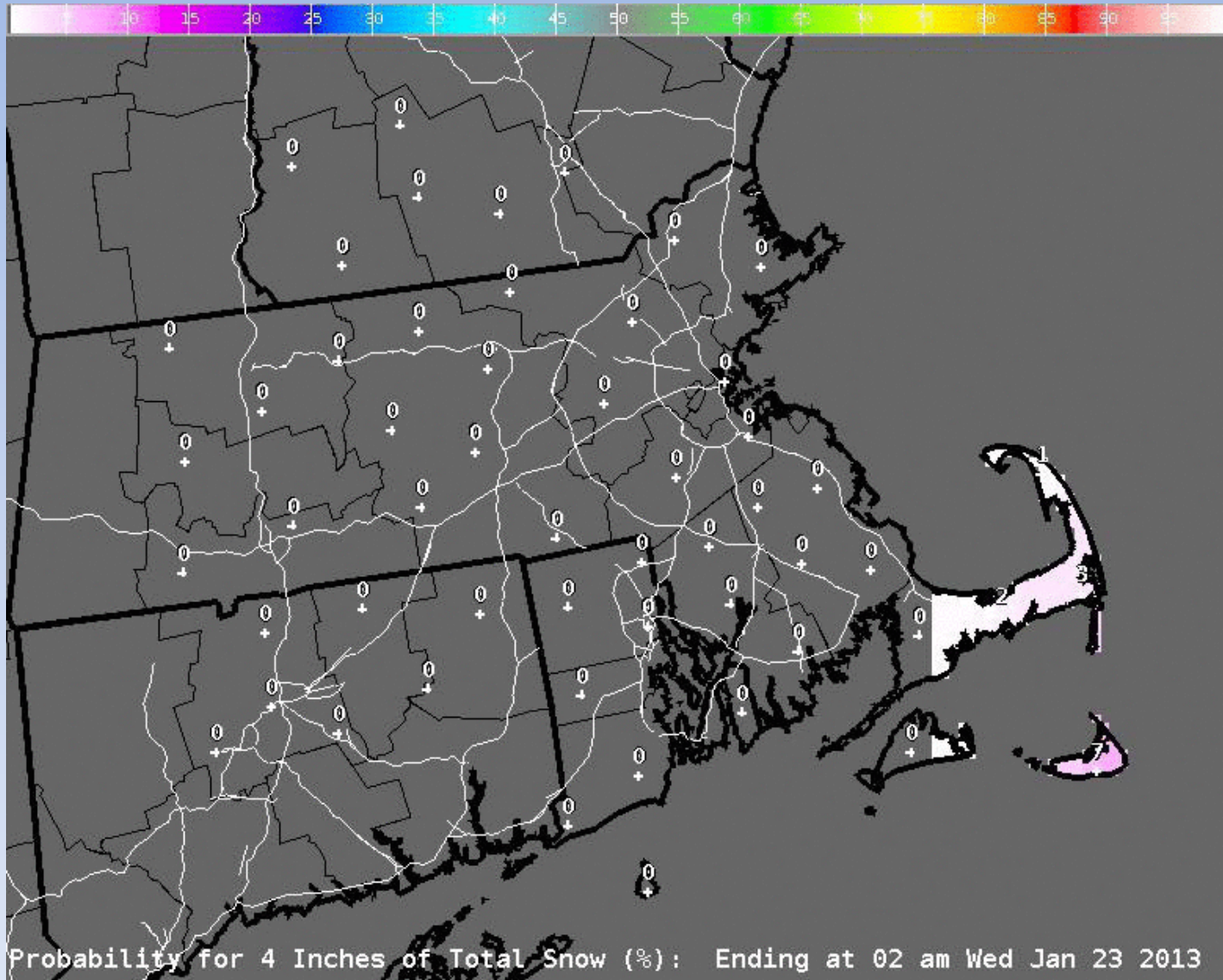
Deterministic Forecasts



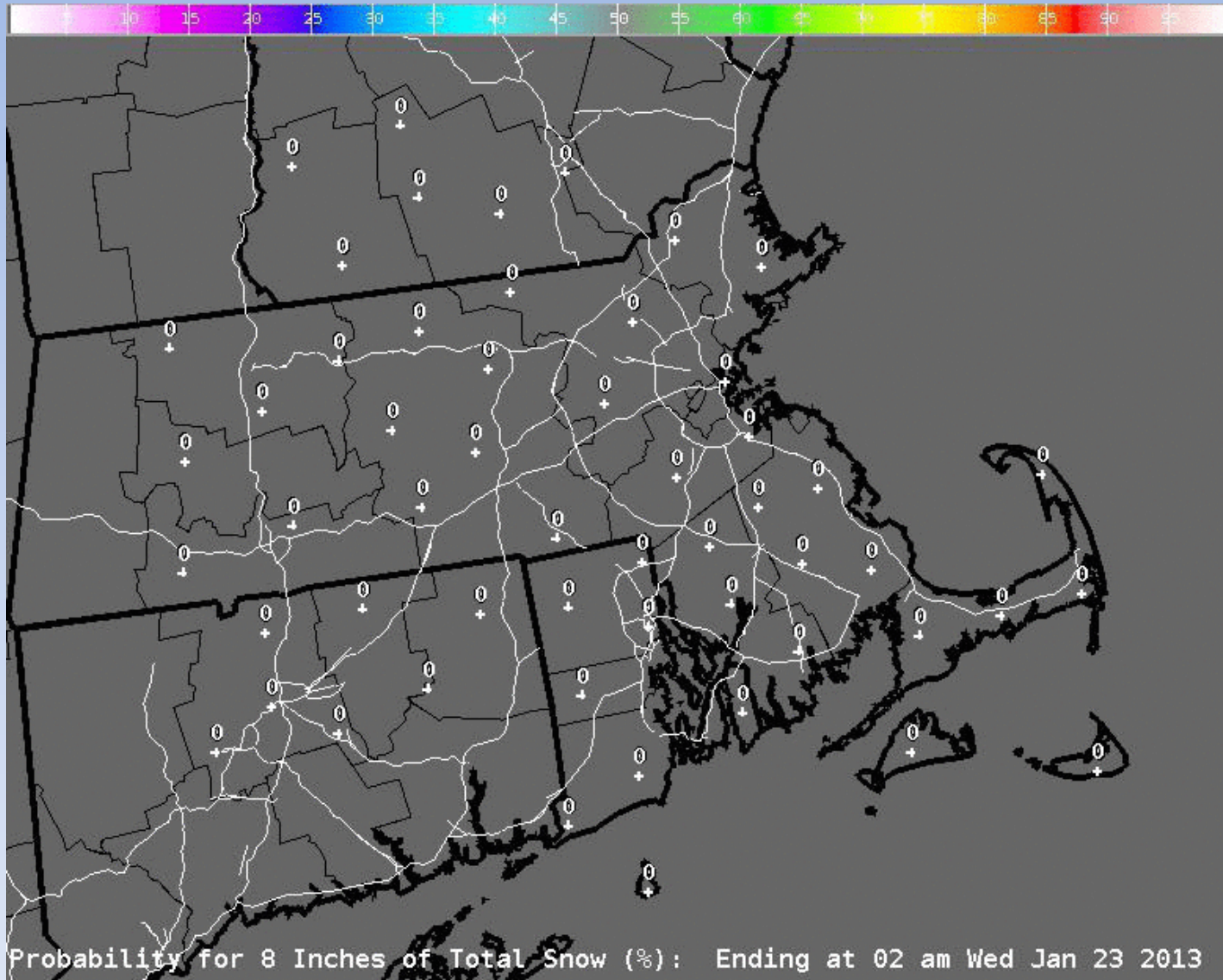
Snow Probs: 1" or Greater



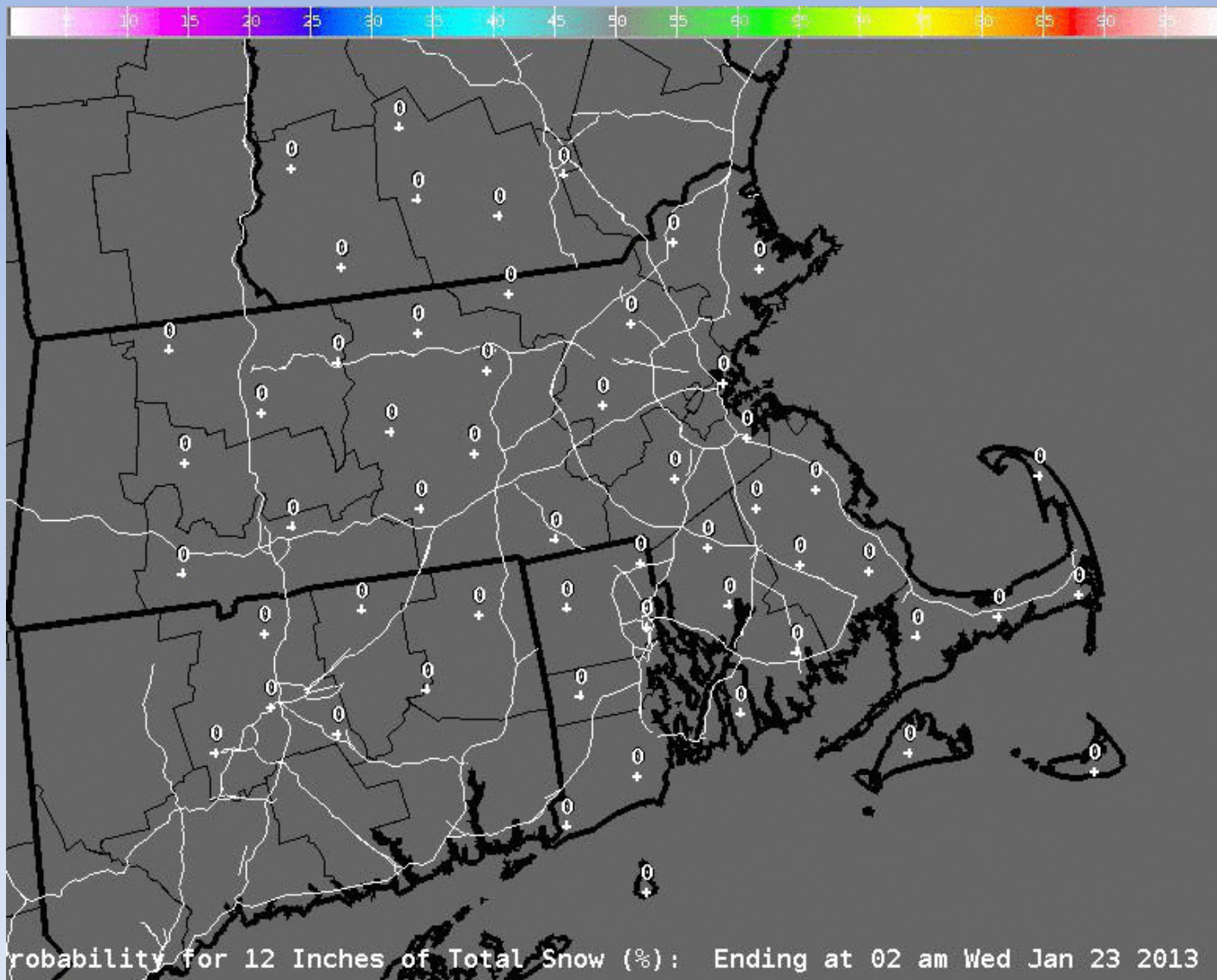
Snow Probs: 4" or Greater



Snow Probs: 8" or Greater



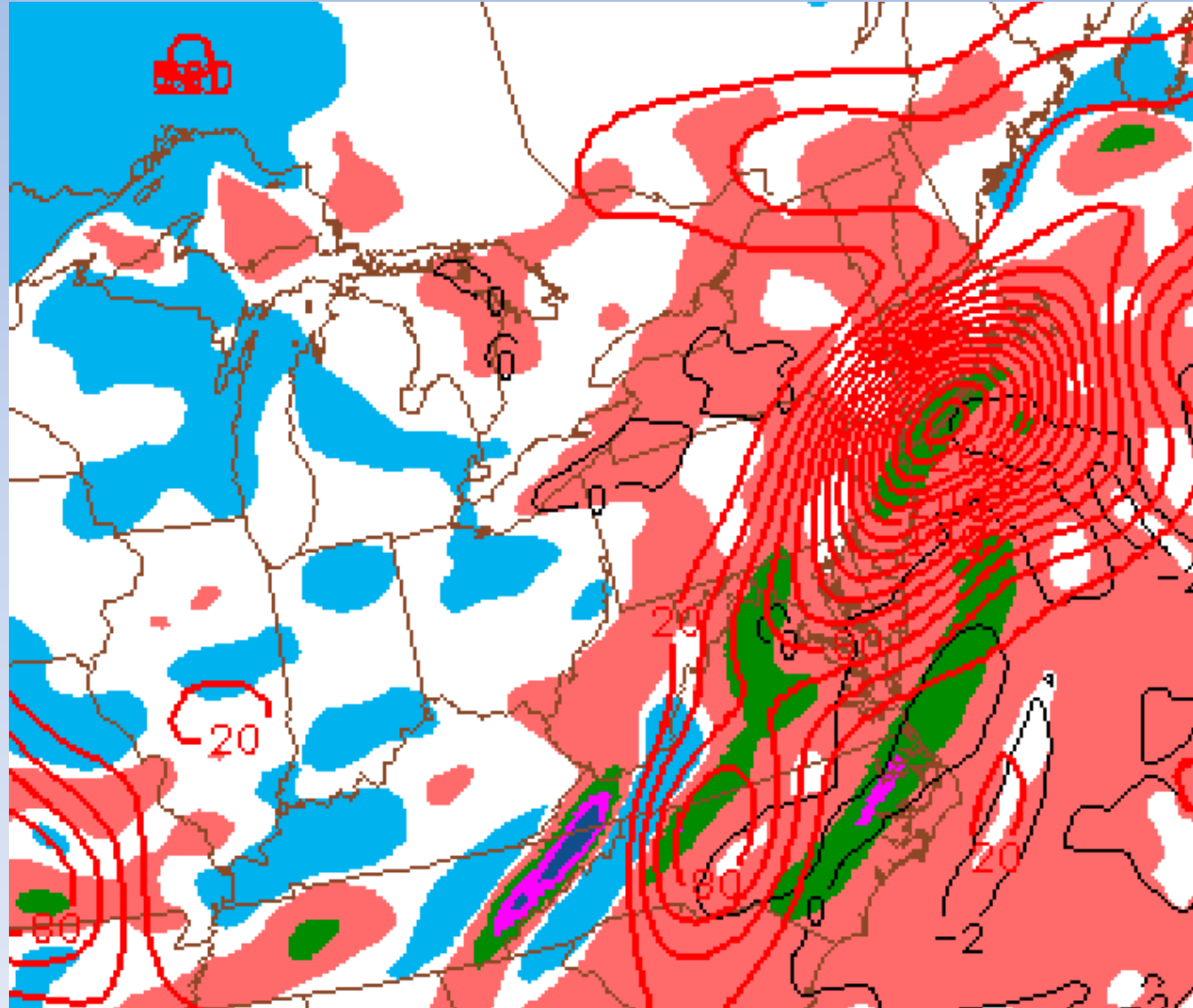
Snow Probs: 12" or Greater



Mesoscale Analysis

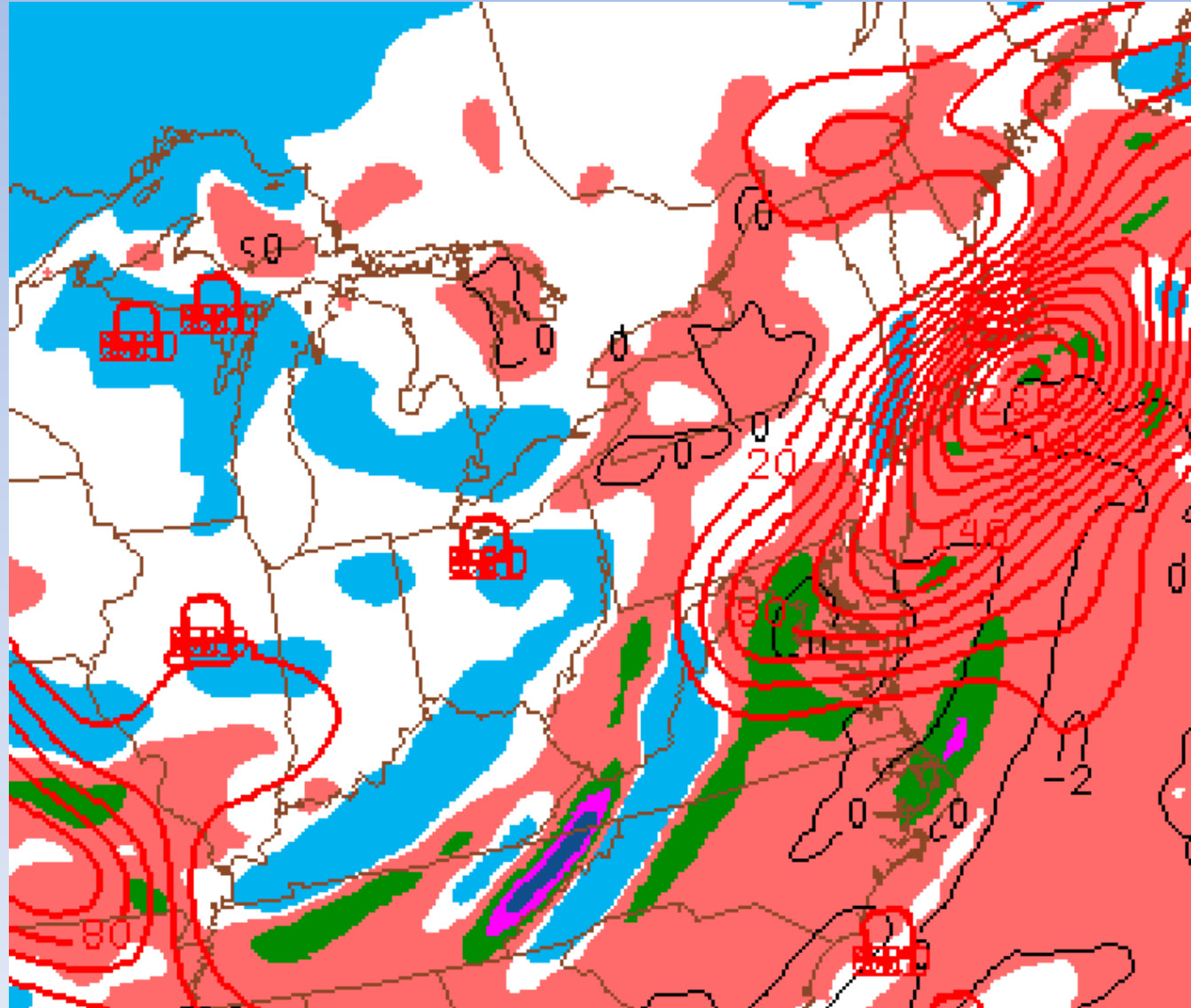
850 mb Frontogenesis and EPV

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



850 mb Frontogenesis and EPV

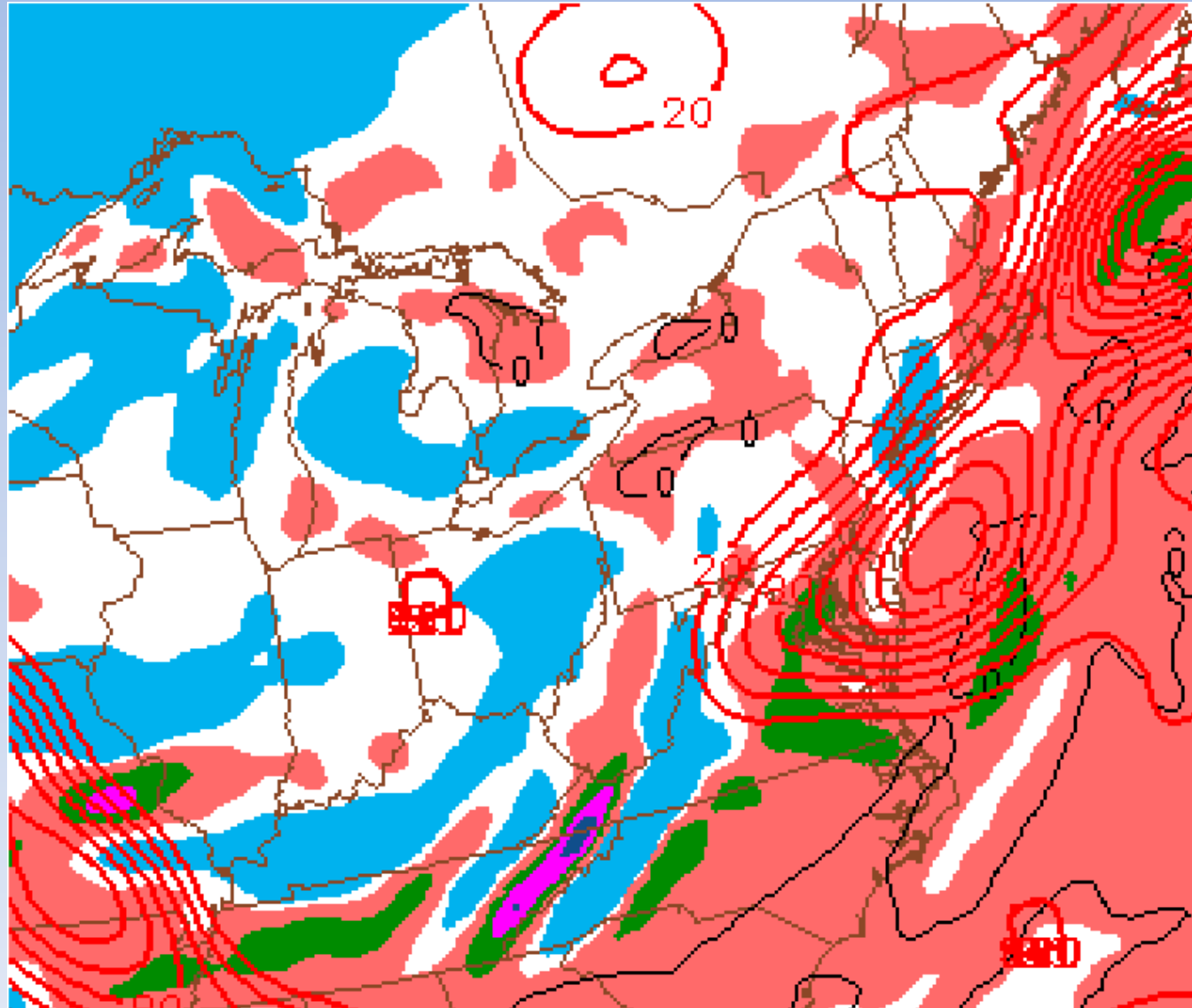
04z Jan 22:
FGEN/-EPV shifts
northeast with axis
south of New
England



850 mb Frontogenesis and EPV

06z Jan 22:

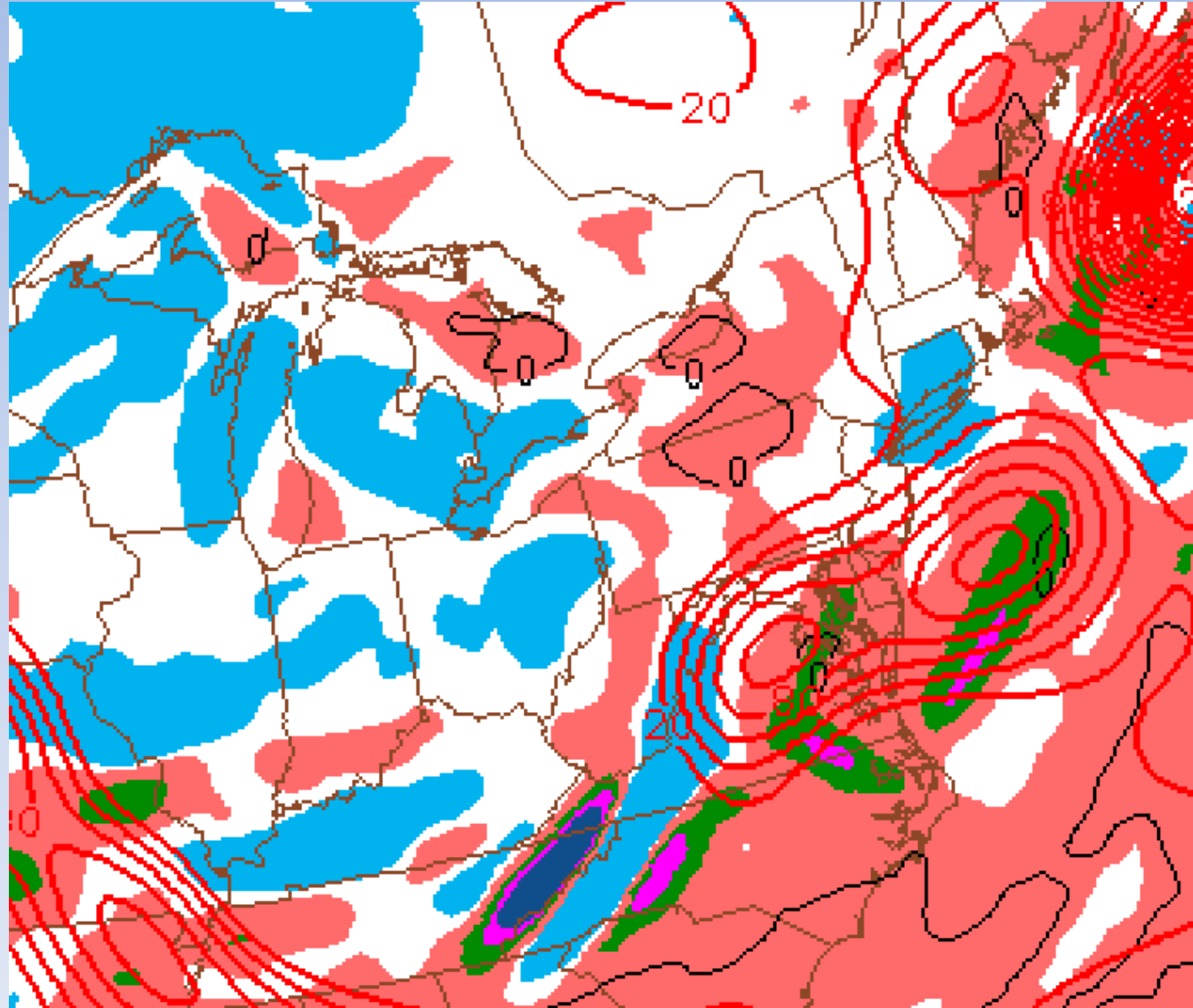
Initial FGEN/-EPV shifts into Gulf of Maine, while second max develops off NJ coast



850 mb Frontogenesis and EPV

08z Jan 22:

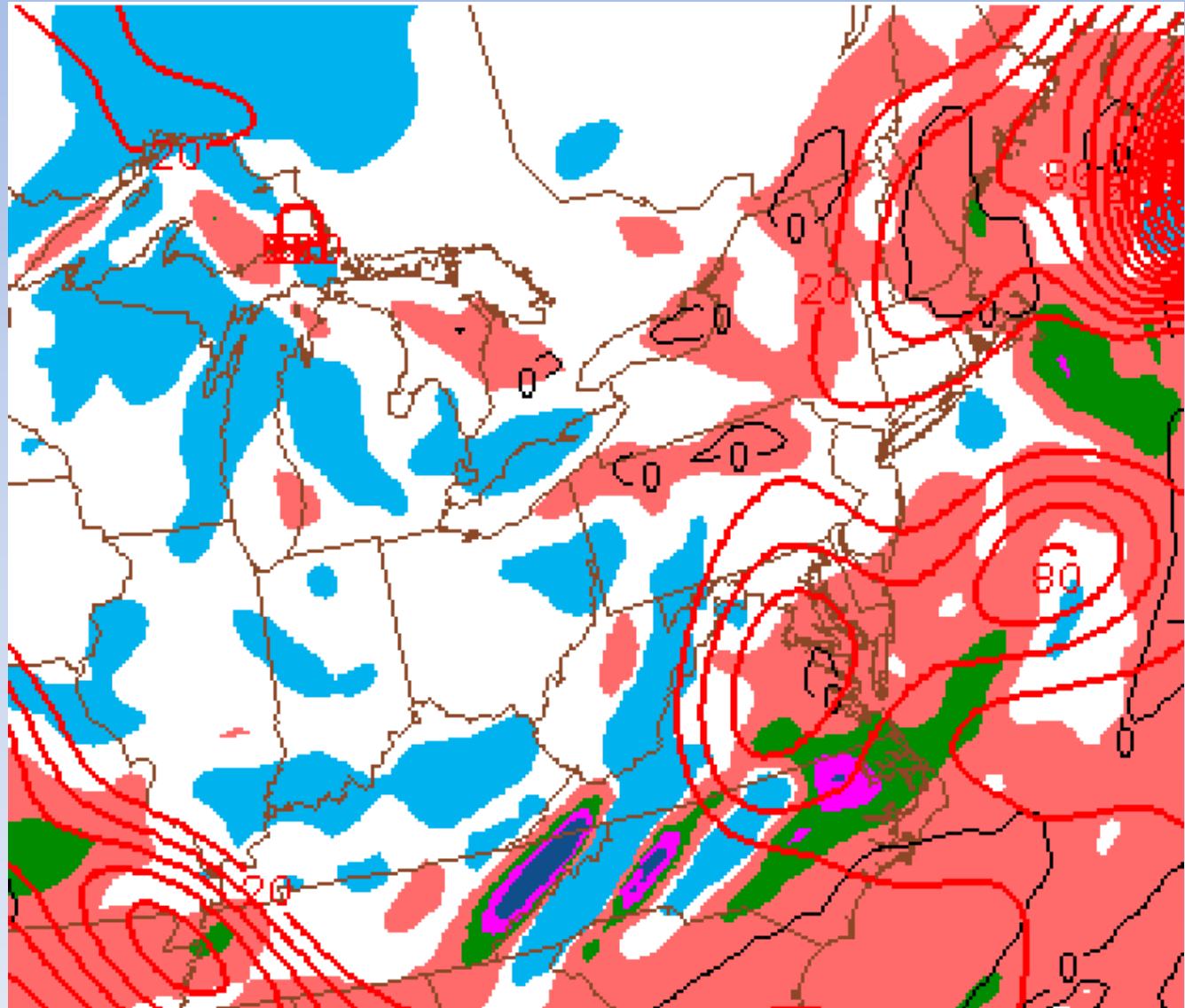
Second max remains well south of New England; only weak FGGEN remains



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