November 7-8, 2012 Coastal Storm: *Using Dual-Pol to Assess Precipitation Type*

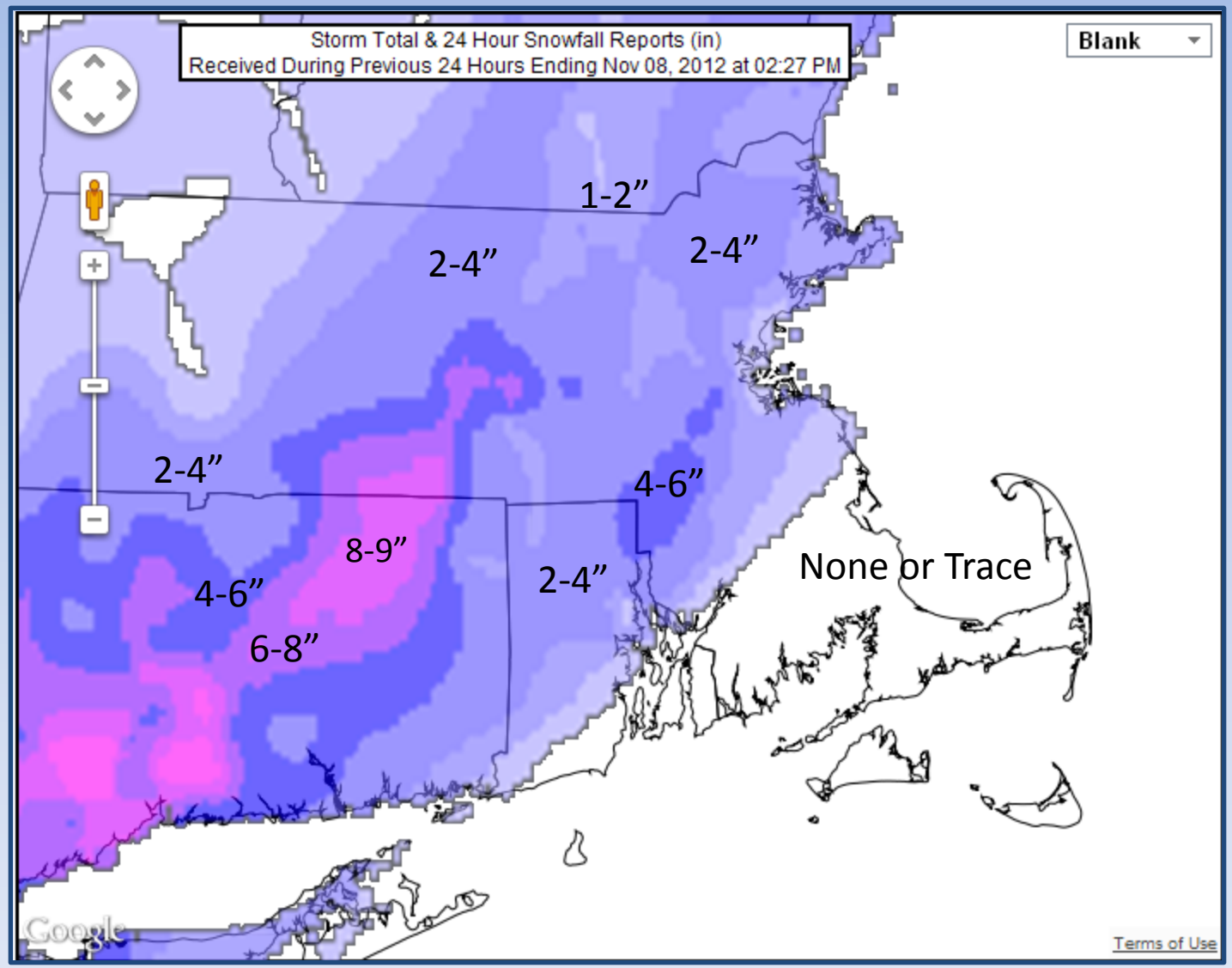
Joe DelliCarpini

SOO WFO Boston

What Happened

Max snowfall of 6-9” across northern CT and south central MA

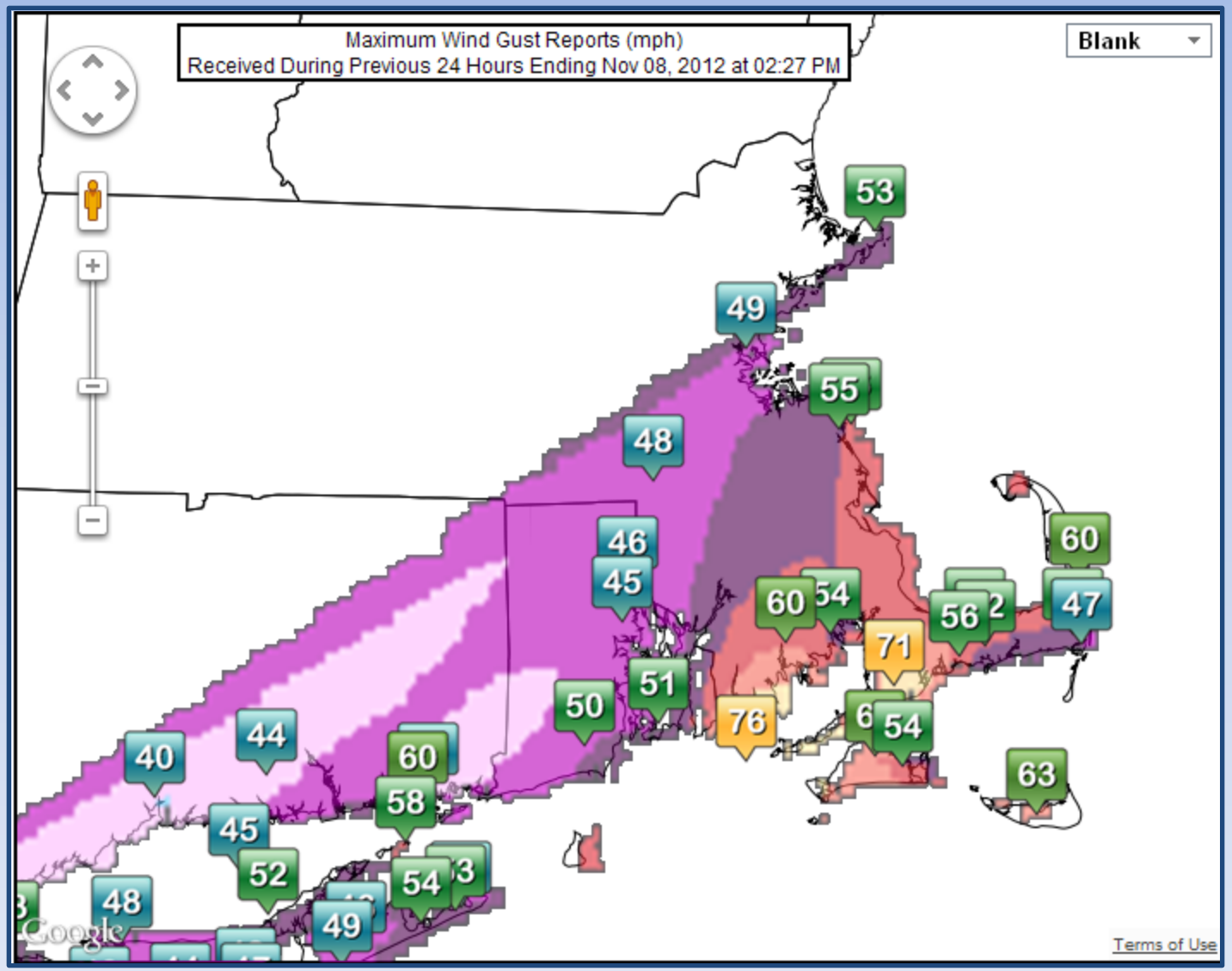
2-4” along I-95 with pockets of 4-6” just NW of coastal front



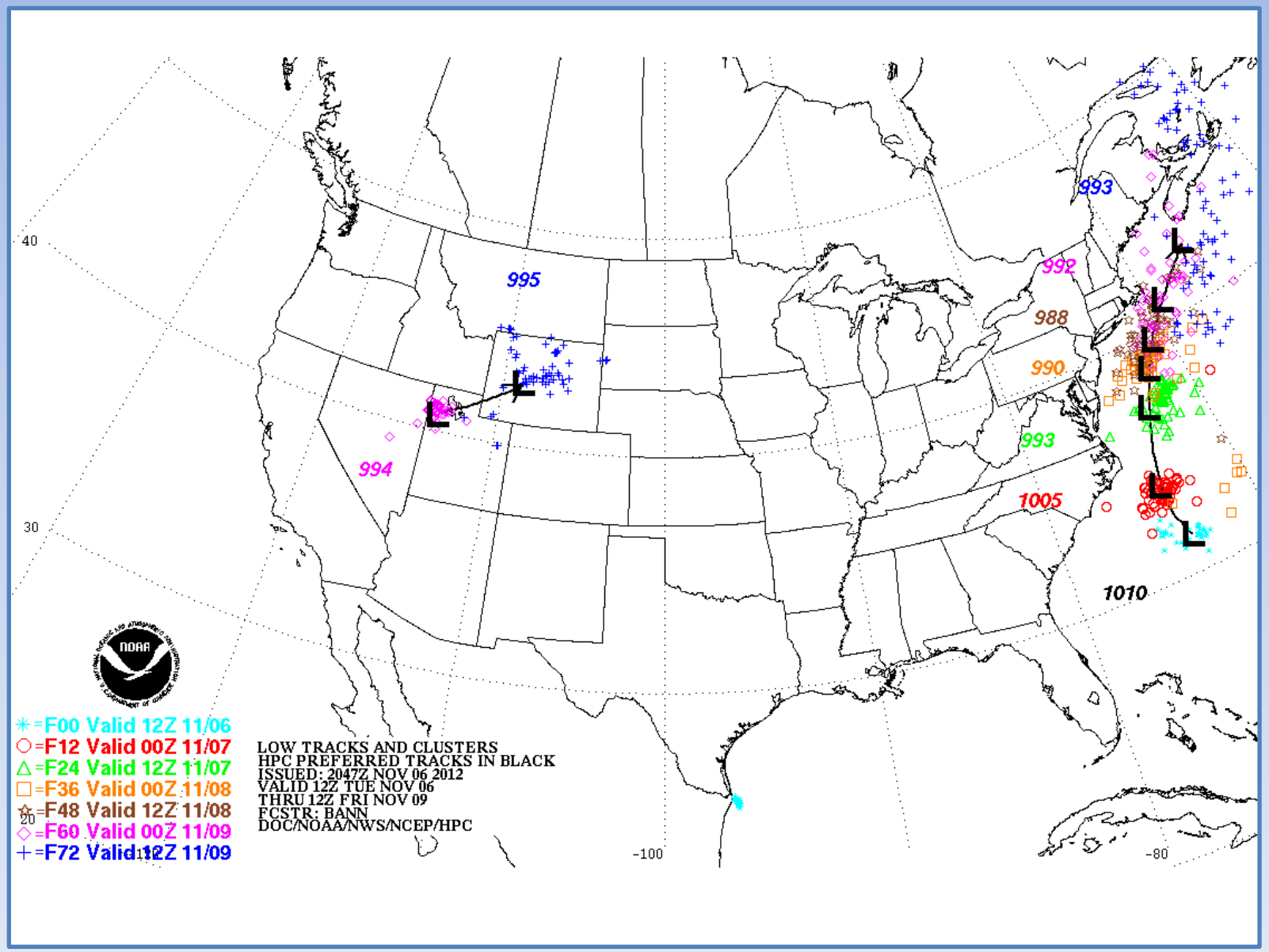
What Happened

Wind gusts of 50-60 mph near the coast, over 70 mph on parts of the South Coast.

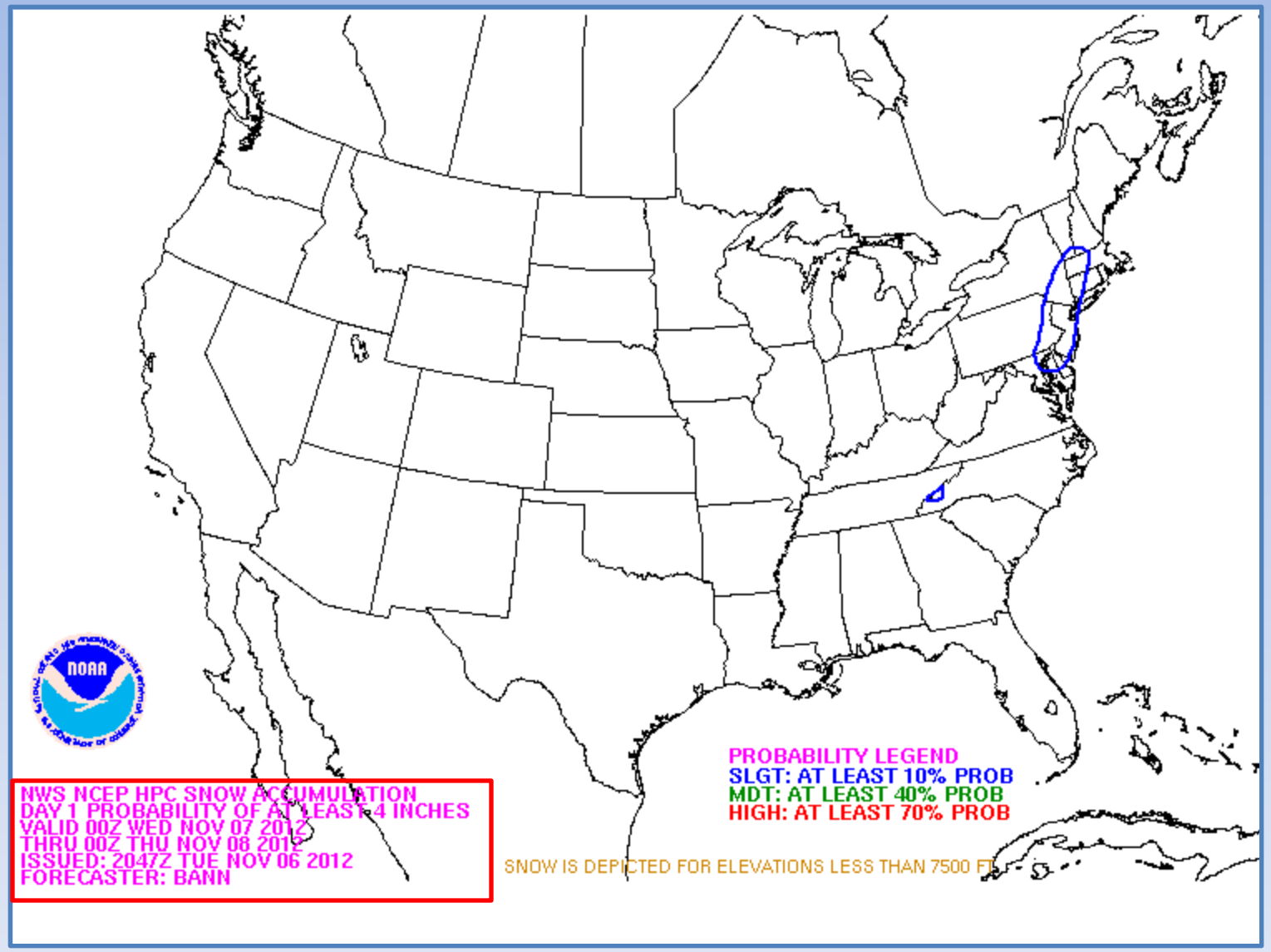
Gusts of 40-50 mph inland on the warm side of the coastal front.



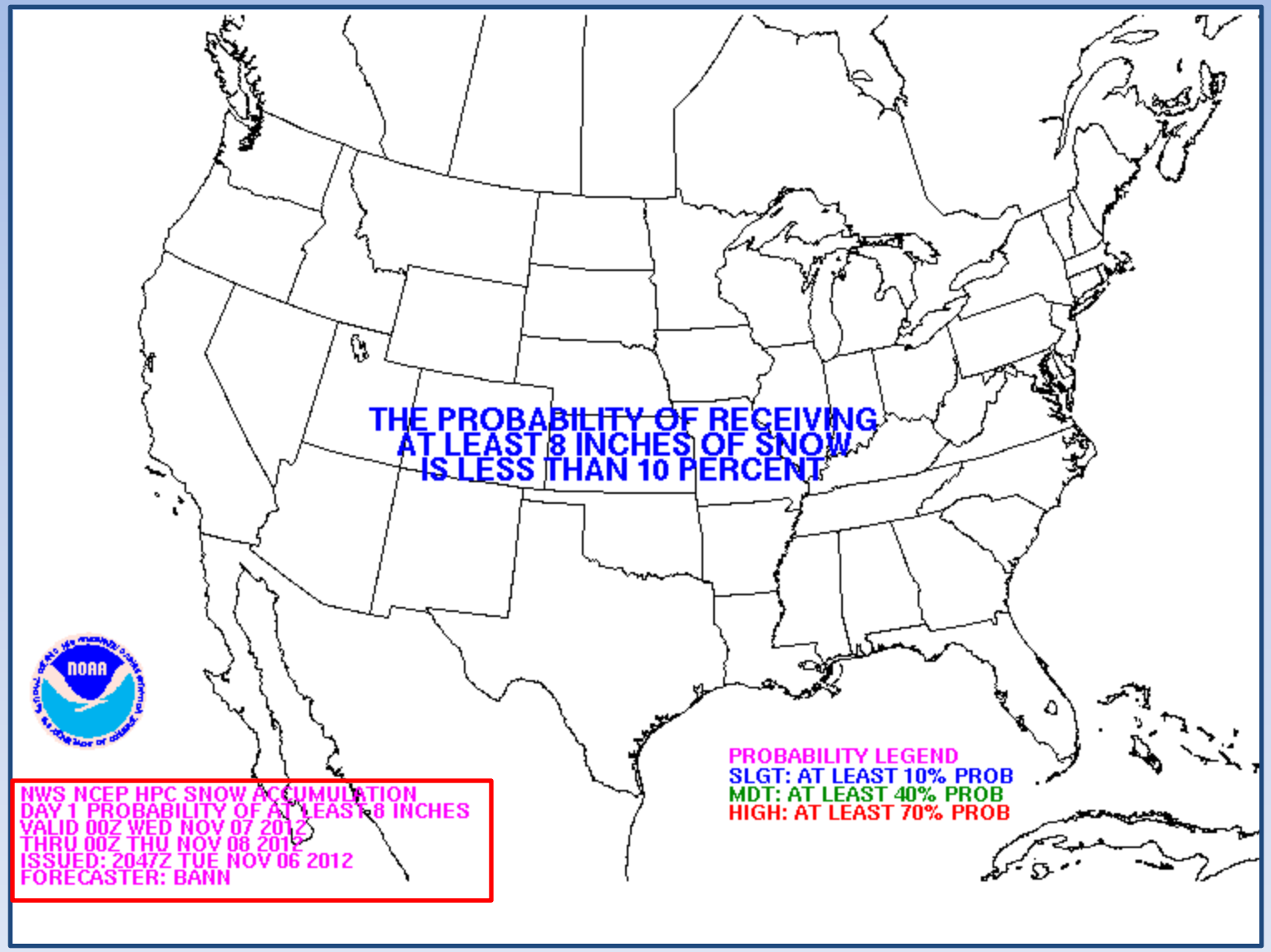
Surface Low Track



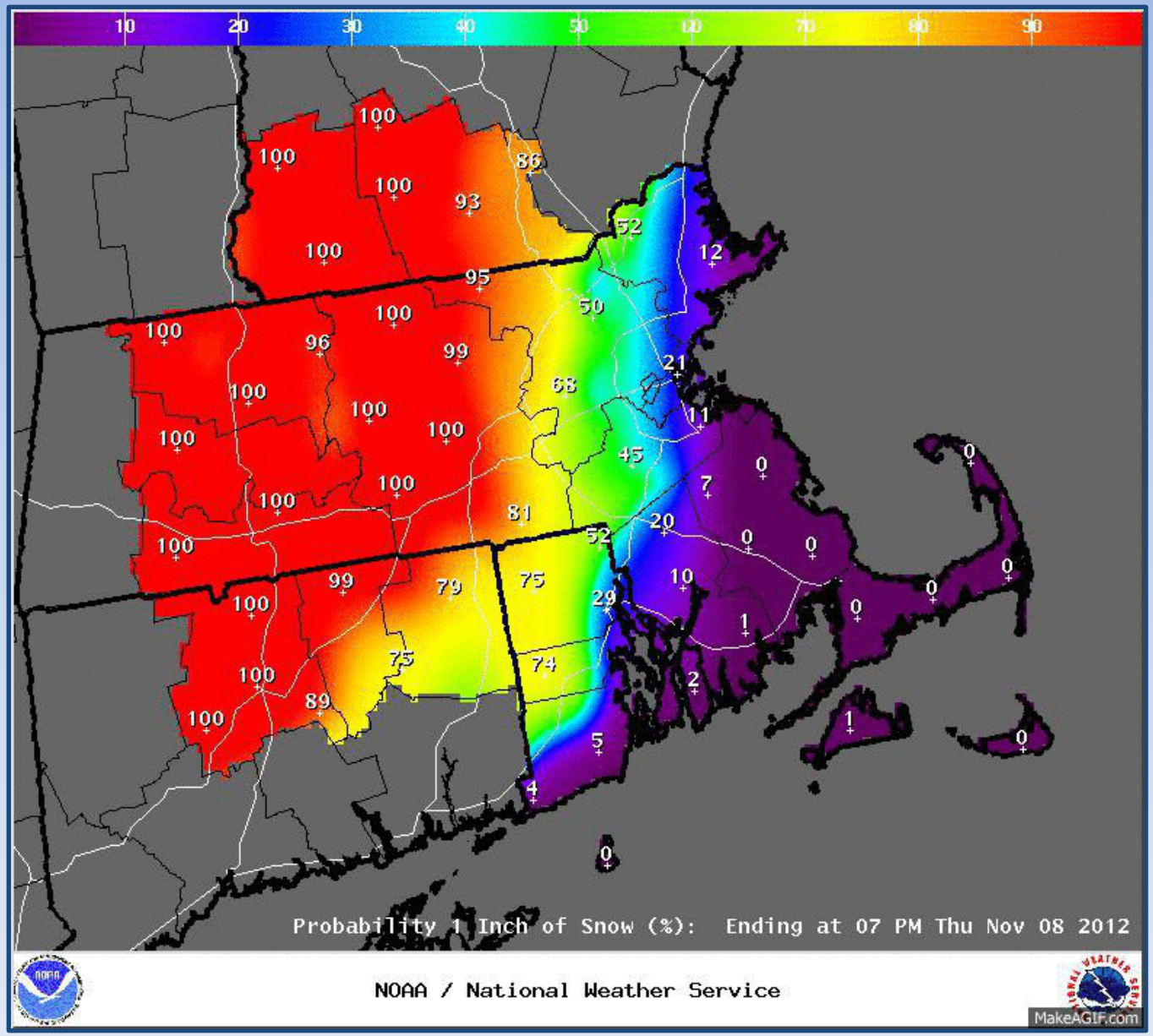
HPC 4” Snowfall Probability



HPC 8” Snowfall Probability



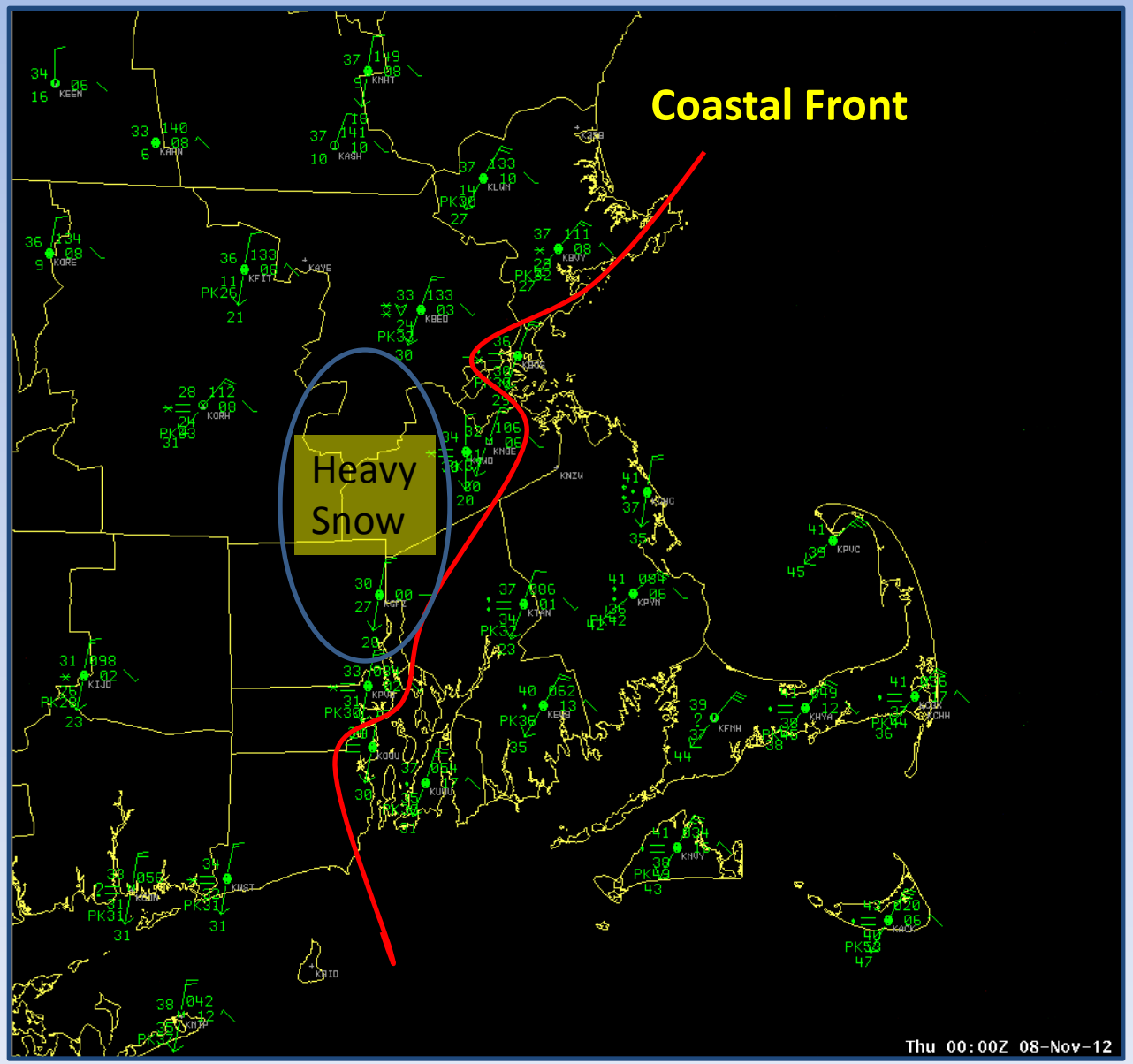
BOX Snowfall Probabilities



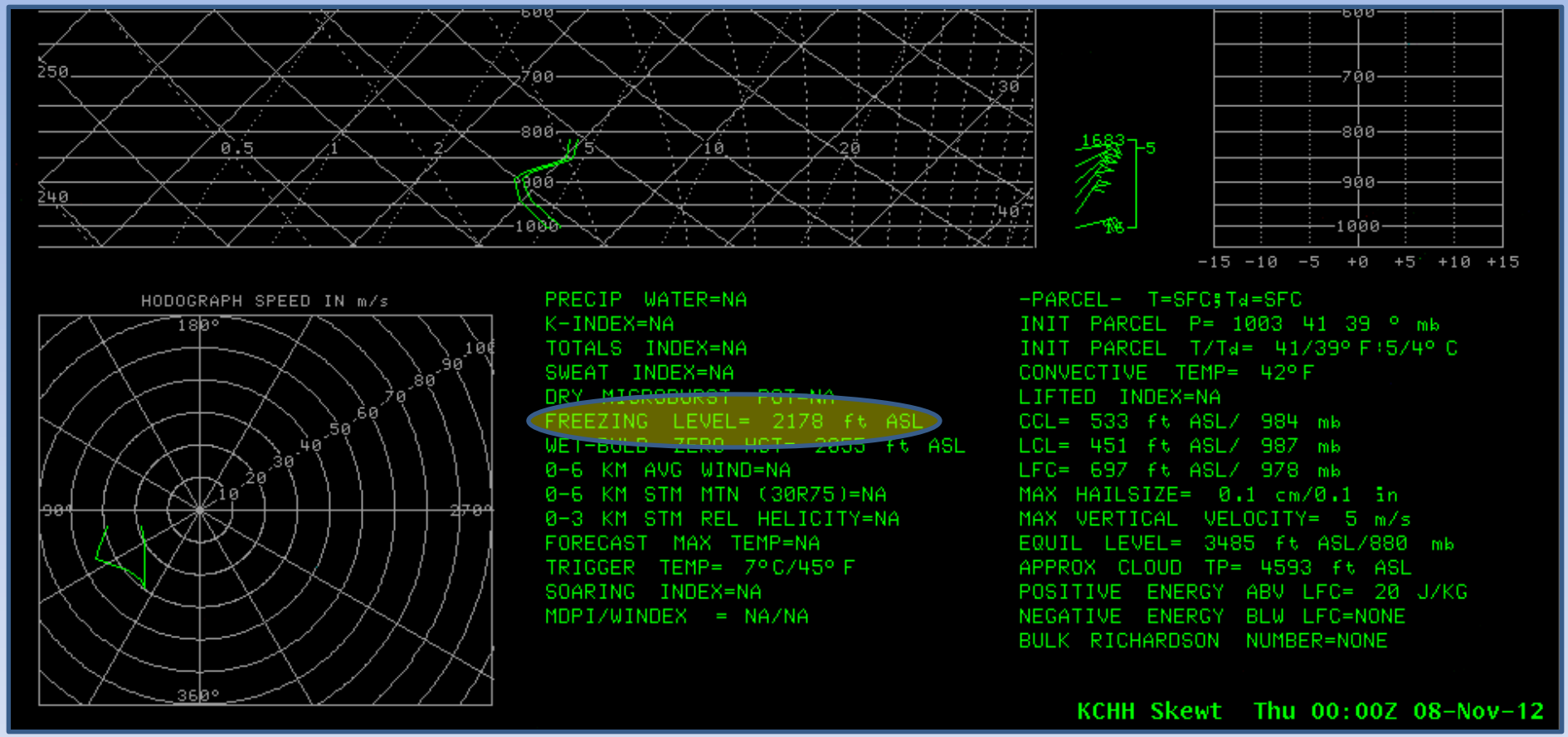
00z Surface Plot

Temperatures in the 30s with snow west of the front; 40s with rain to the east.

Bands of heavy snow set up just west of the boundary across northern Rhode Island and interior eastern Massachusetts



00z Chatham, MA Sounding



Partial sounding due to balloon break

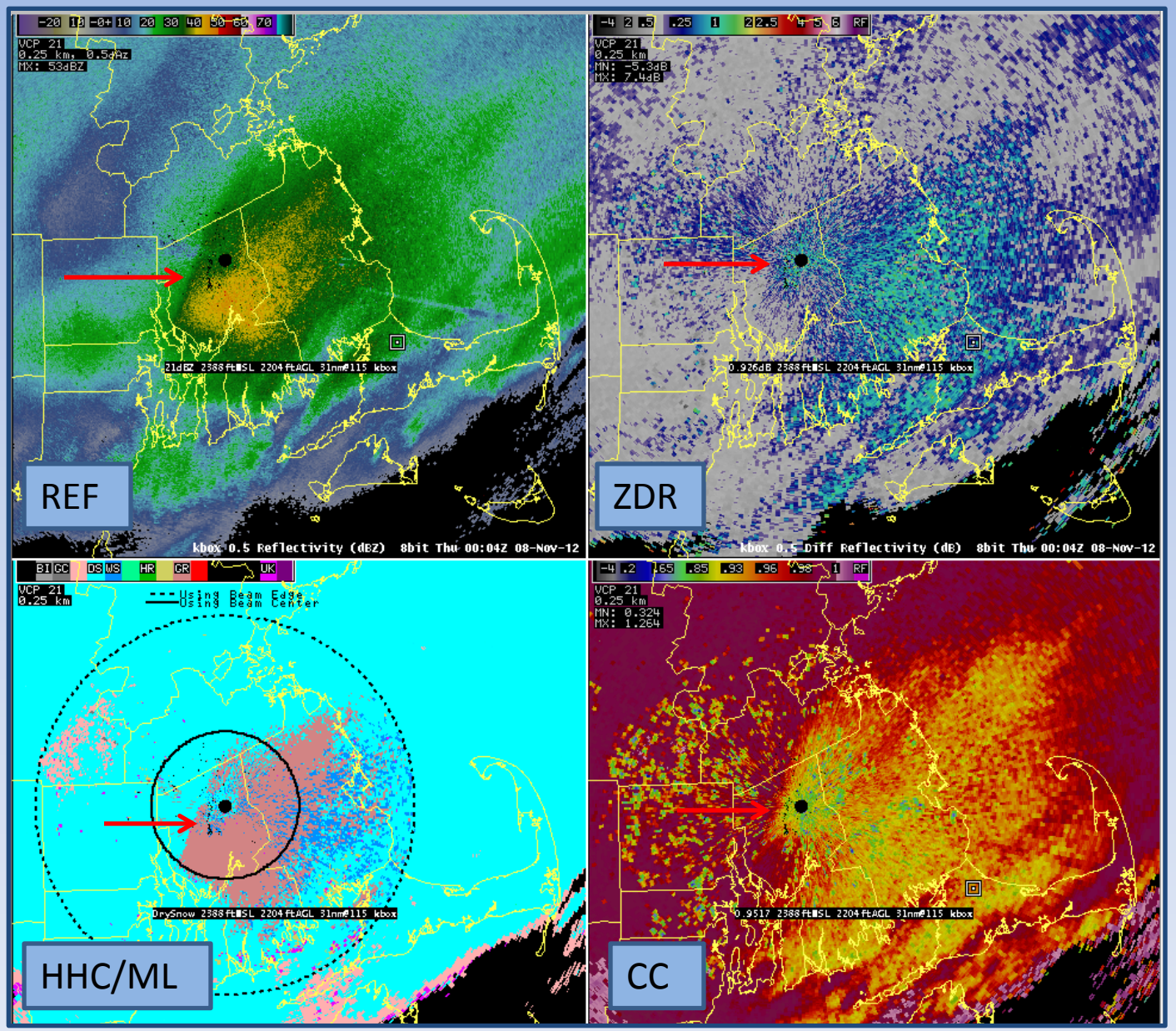
Freezing level 2,178 ft ASL

KBOX 0.5 Dual-Pol 4 Panel: 0004Z

Rain/snow line clearly evident on all products

ML too low using beam center; closer using beam edge (Radar: 2,388 ft ASL CHH: 2,178ft ASL)

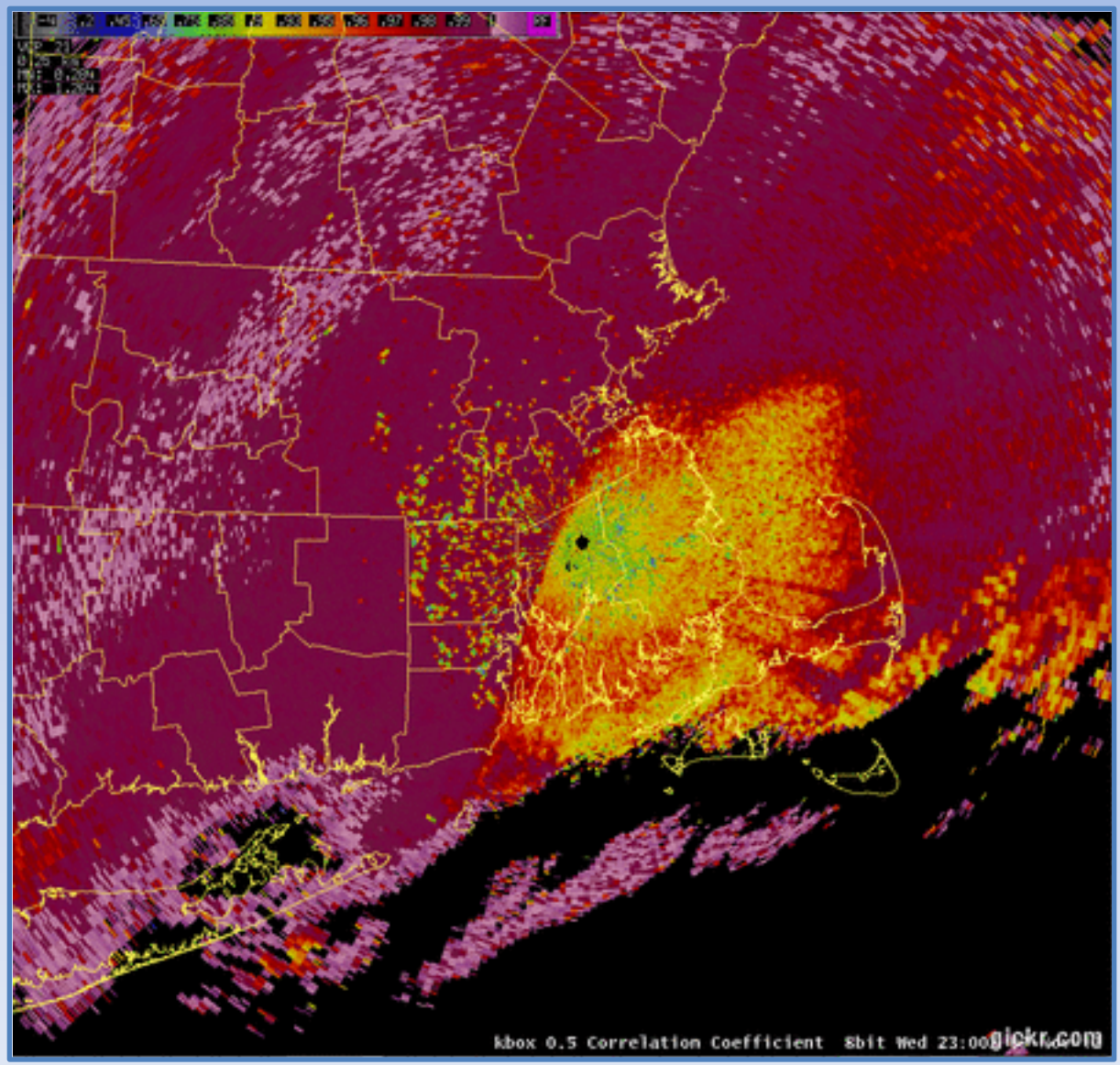
HHC was incorrect on Cape Cod (dry snow instead of rain) since the beam was sampling sub-freezing air



KBOX 0.5 CC Loop: 23Z-02Z

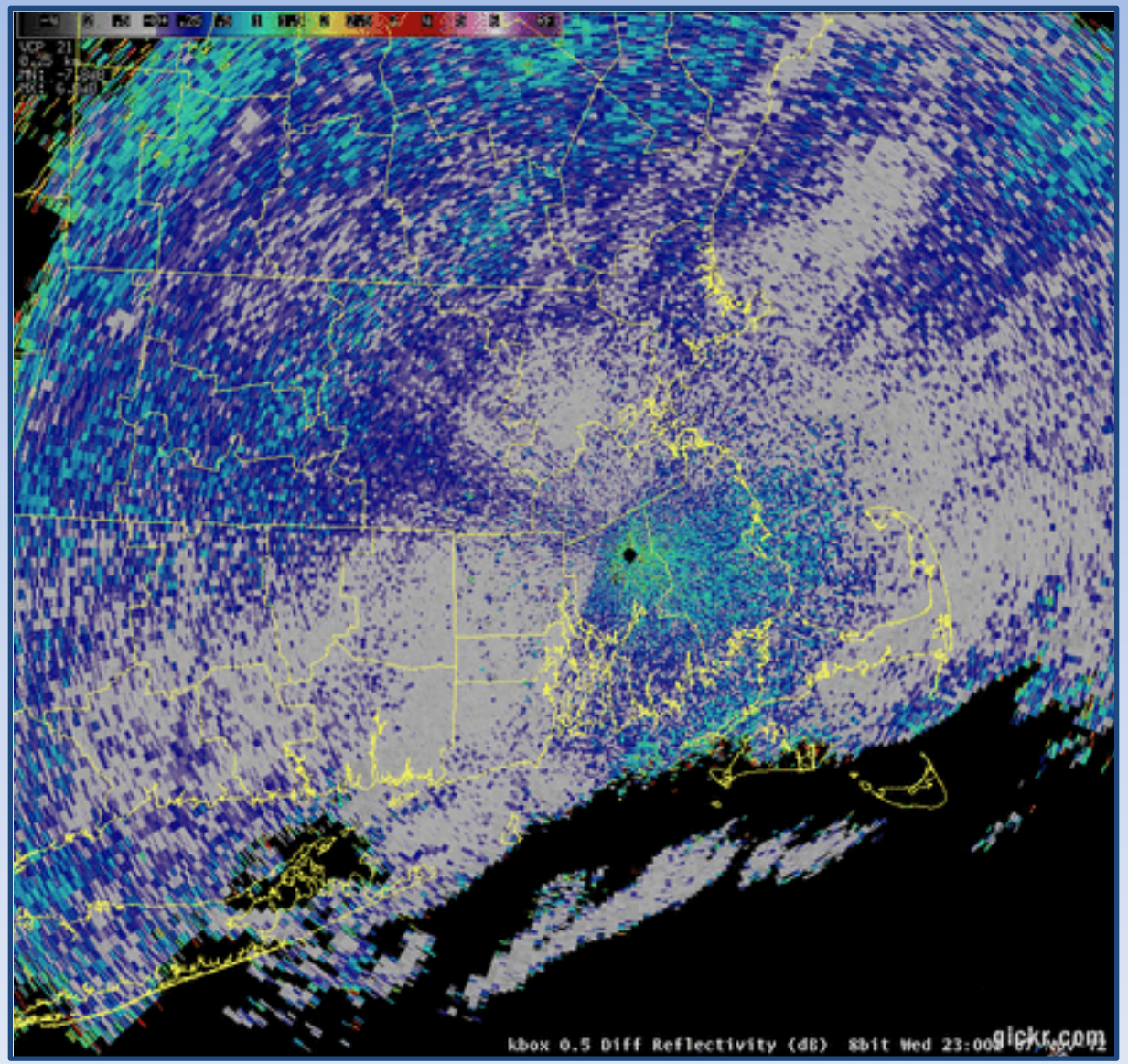
Higher CC values in cold air indicative of snow, while lower values south and east of RDA indicate rain or a rain/snow mix.

Note the slow southward shift of the boundary, especially near Narragansett Bay.



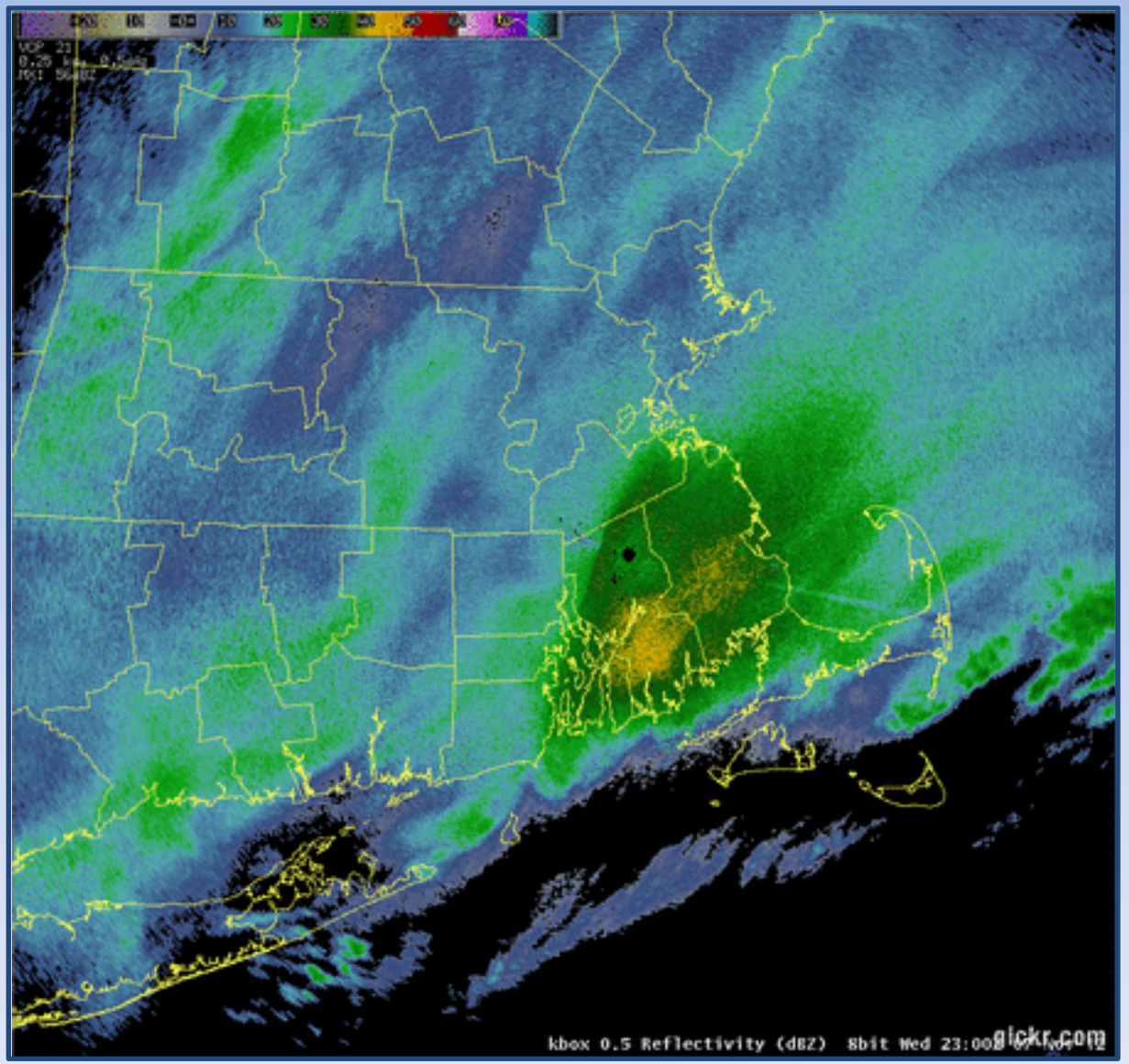
KBOX 0.5 ZDR Loop: 23Z-02Z

Lower ZDR values (gray) indicative of snow, while higher values over Bristol and Plymouth Counties (blue and green) indicate rain or a rain/snow mix.



KBOX 0.5 REF Loop: 23Z-02Z

Note gradual southward progression of the rain/snow line, especially to the west of the RDA.



Summary

- Rely on base products (CC, ZDR in particular) as opposed to algorithms to determine precipitation type
  - Ensure Melting Layer (ML) is reasonable by using observed soundings
  - Hydrometeor Class product is affected by ML and may not be reliable
- Be aware of what height the radar is sampling
  - Not necessarily representative of what is happening at the ground!