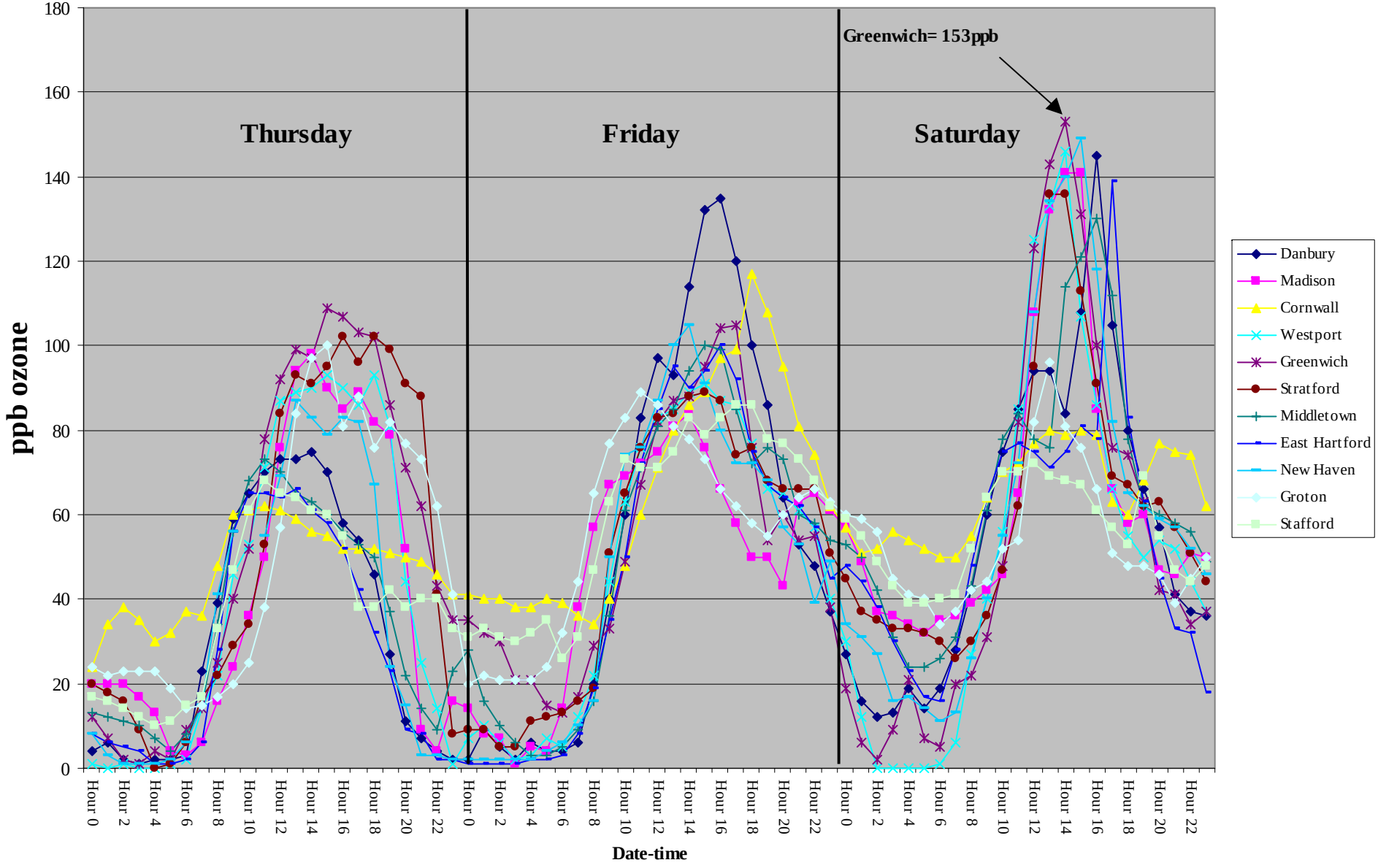
Connecticut Ozone Event
August 11-13, 2005

August 12, 2005

Connecticut Ozone Concentrations August 11-13, 2005

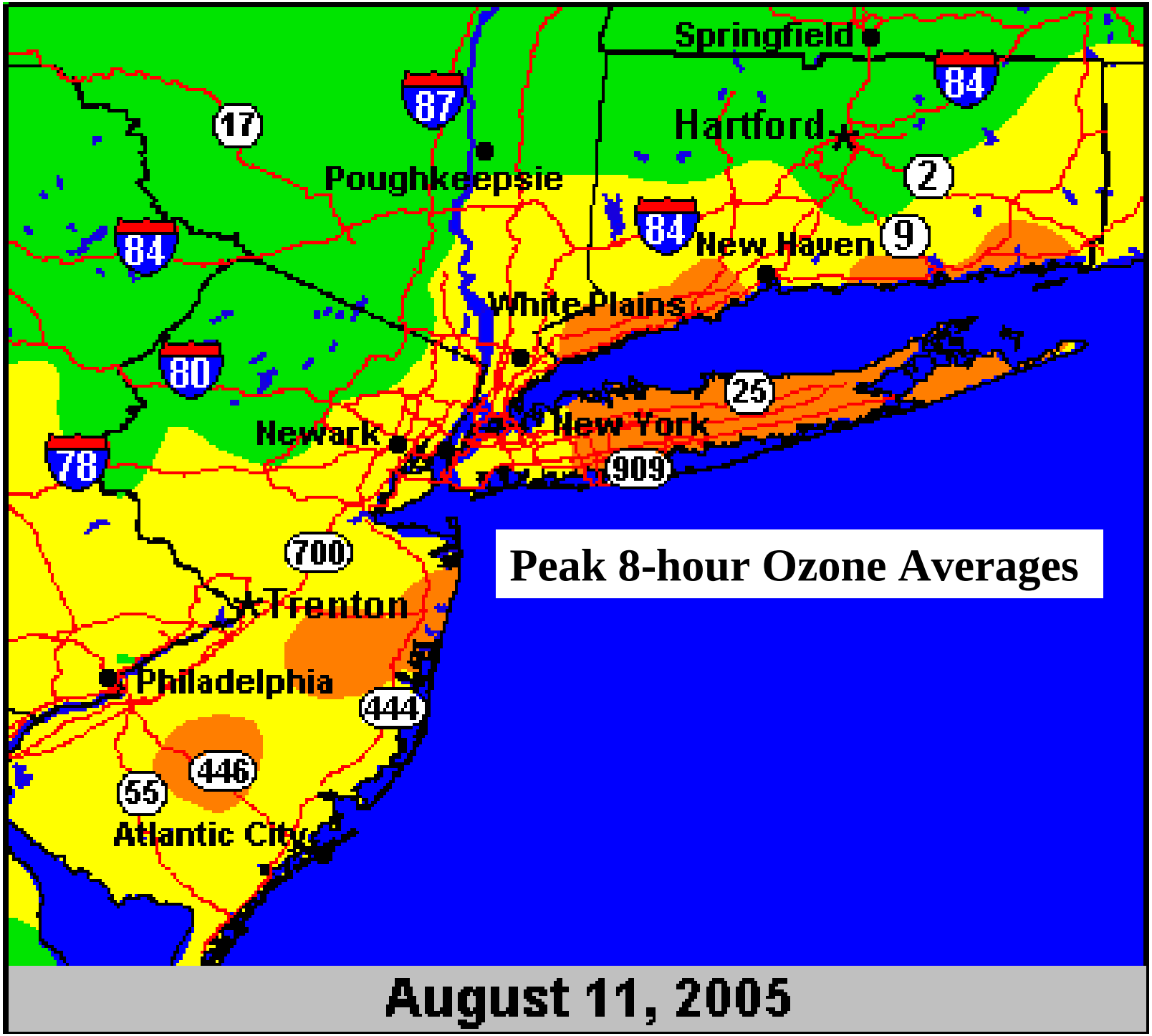


8-Hour Ozone Averages for Connecticut

Site	8/11/2005	8/12/2005	8/13/2005
Groton	**85**	79	69
Stafford	60	80	67
E. Hartford	60	**87**	84
Madison	**86**	73	**99**
Middletown	63	**86**	**99**
New Haven	76	**85**	**108**
Danbury	67	**109**	**99**
Greenwich	**99**	**88**	**110**
Stratford	**96**	82	**96**
Westport	**88**	84	**100**
Cornwall	58	**96**	75
	5 sites = USG	5 sites = USG	5 sites = USG
		1 site = Unhealthy	2 sites = Unhealthy

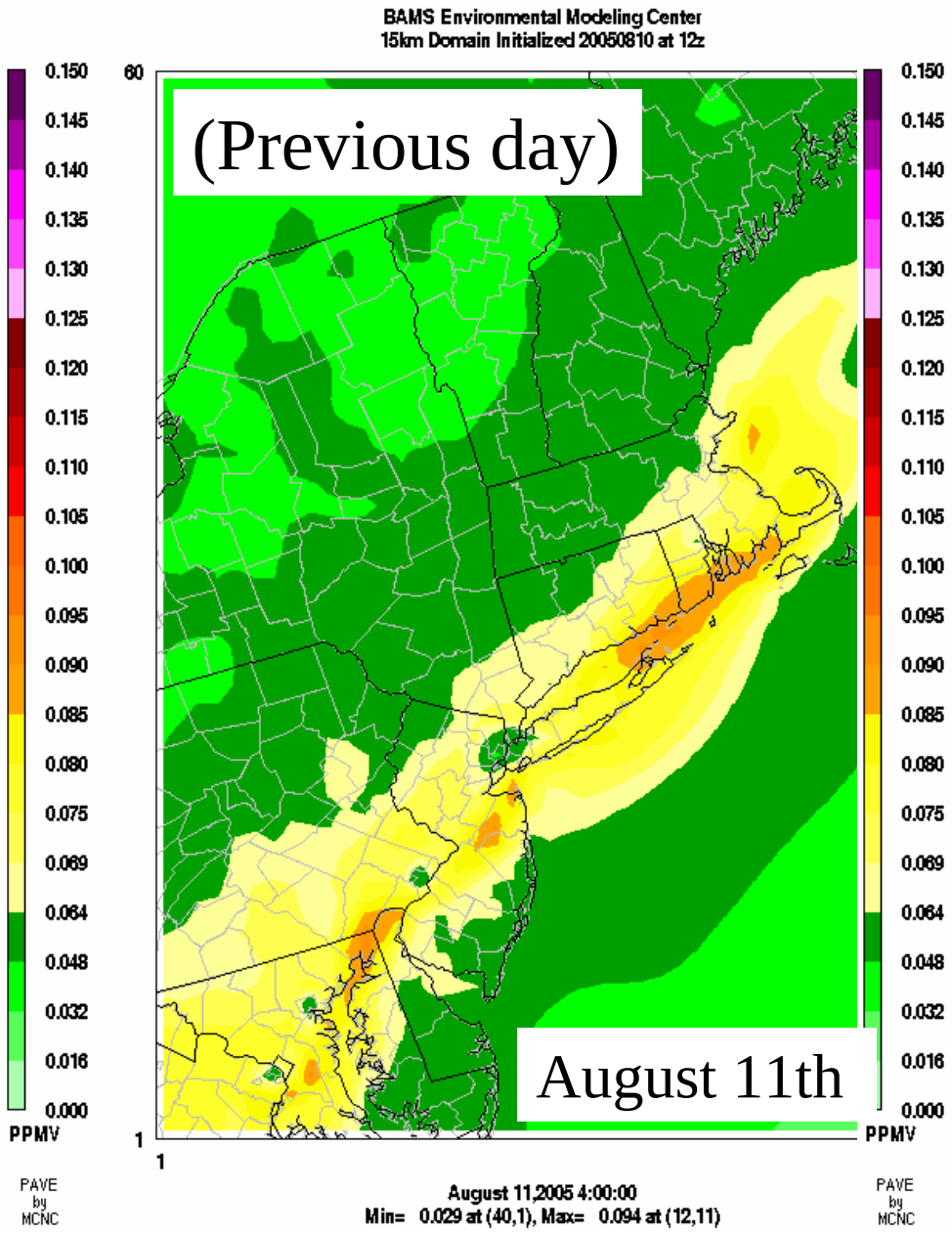
Connecticut 1-hour Ozone peaks (ppb)

	8/11/2005	8/12/2005	8/13/2005
Danbury	75	**135**	**145**
Madison	98	84	**141**
Cornwall	62	117	80
Westport	93	91	**146**
Greenwich	109	105	**153**
Stratford	102	89	**136**
Middletown	73	100	**130**
East Hartford	66	100	**139**
New Haven	87	105	**149**
Groton	100	89	96
Stafford	68	86	72

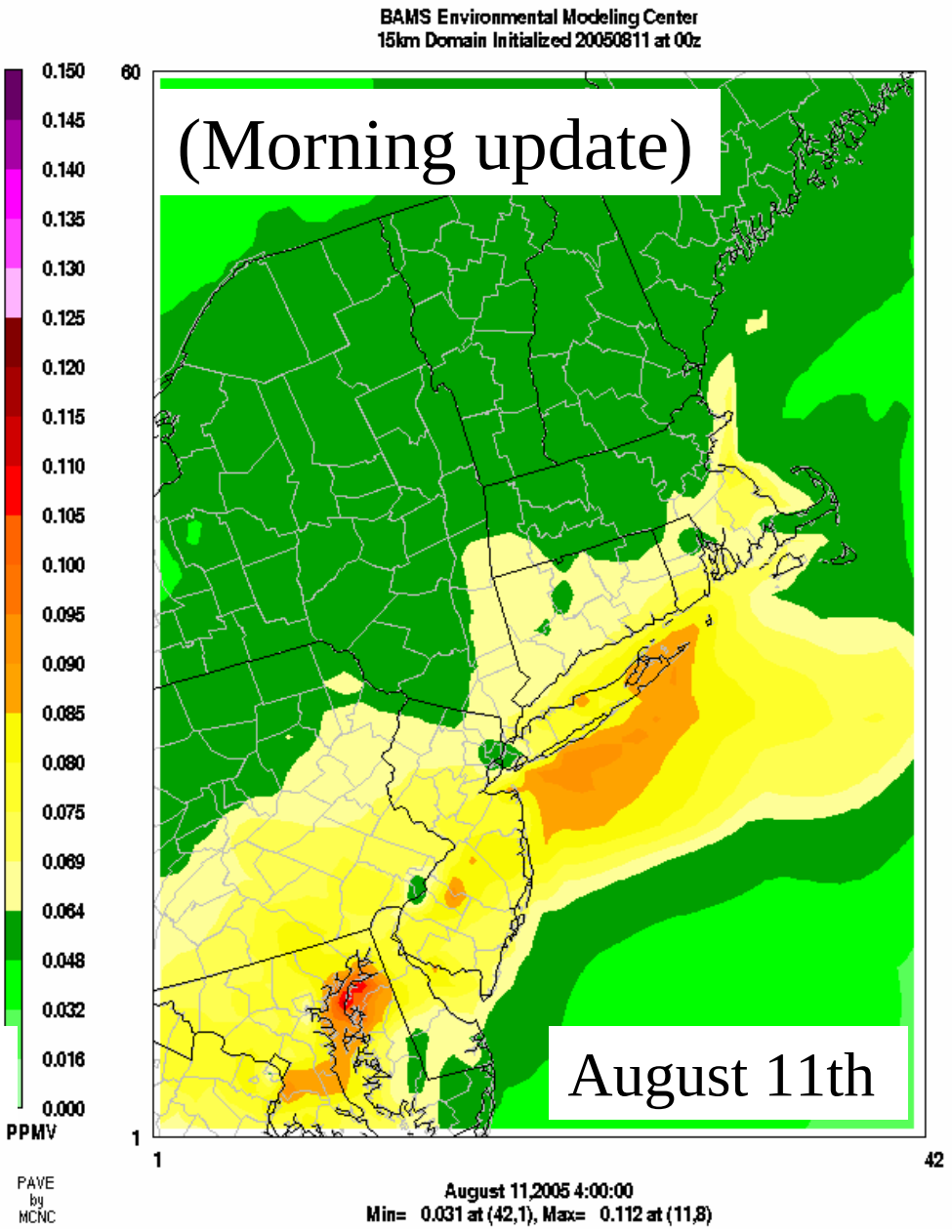

Springfield
84
87
17
Hartford
Poughkeepsie
2
84
84
New Haven
9
White Plains
80
25
Newark
New York
78
909
700
Trenton
Philadelphia
444
446
55
Atlantic City
Peak 8-hour Ozone Averages
August 11, 2005

MAQSIP Model Predictions

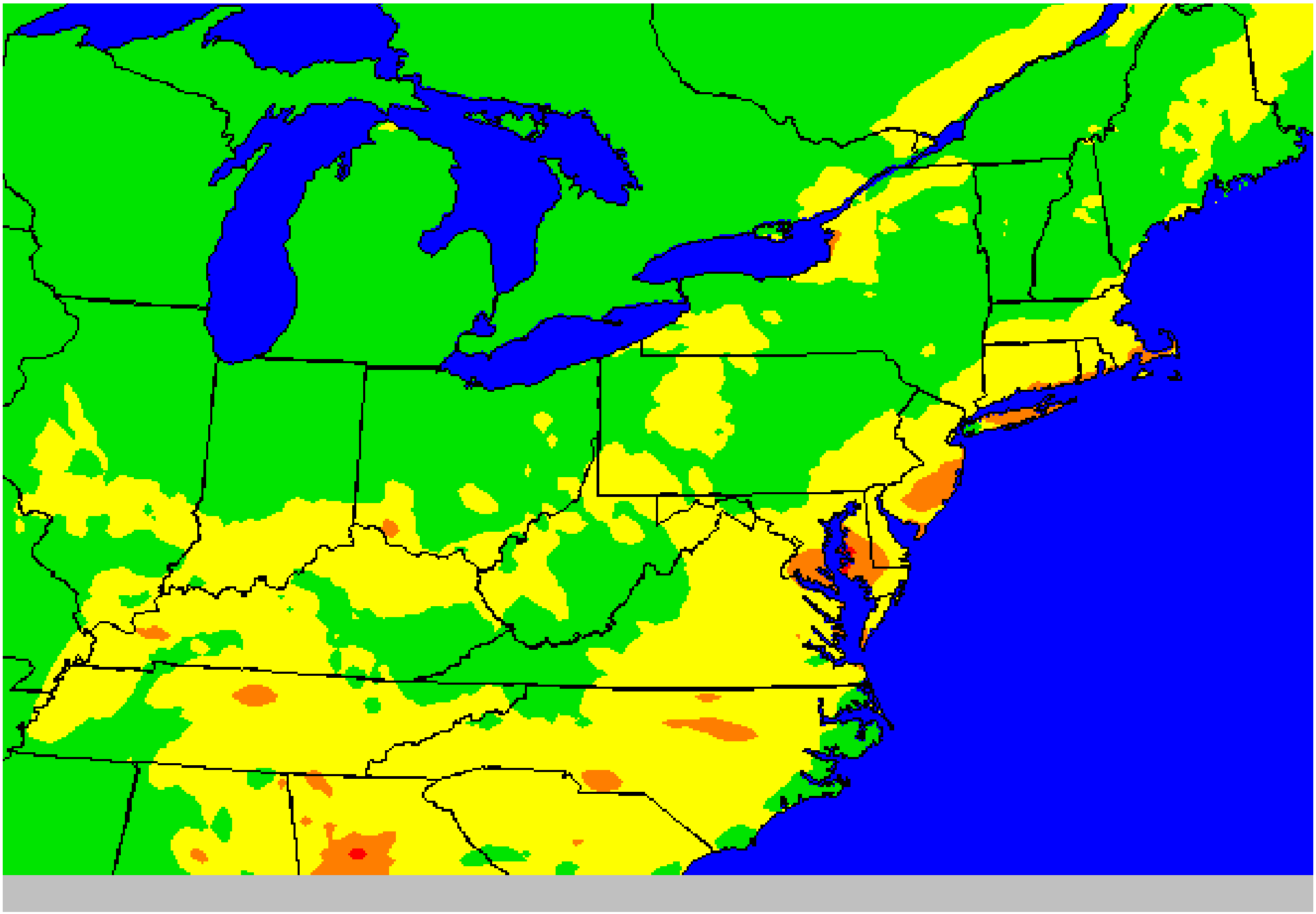
24HR Peak 8HR–AVE Ozone –– NE (NESCAUM

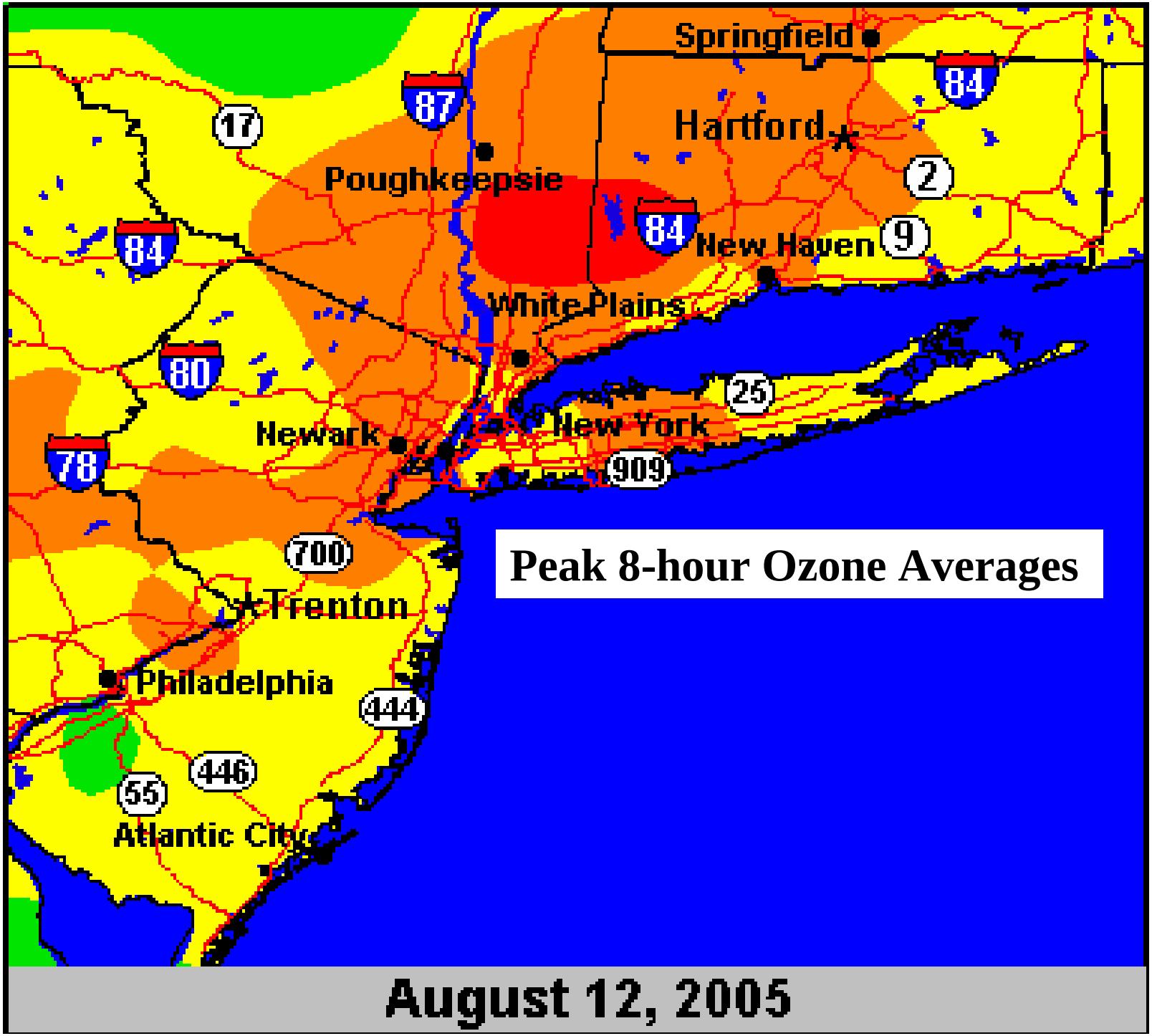


24HR Peak 8HR–AVE Ozone –– NE (NESCAUM) Corridor



Forecast for 8-hr peak (AQI) on 8/11/2005 (NWS model)

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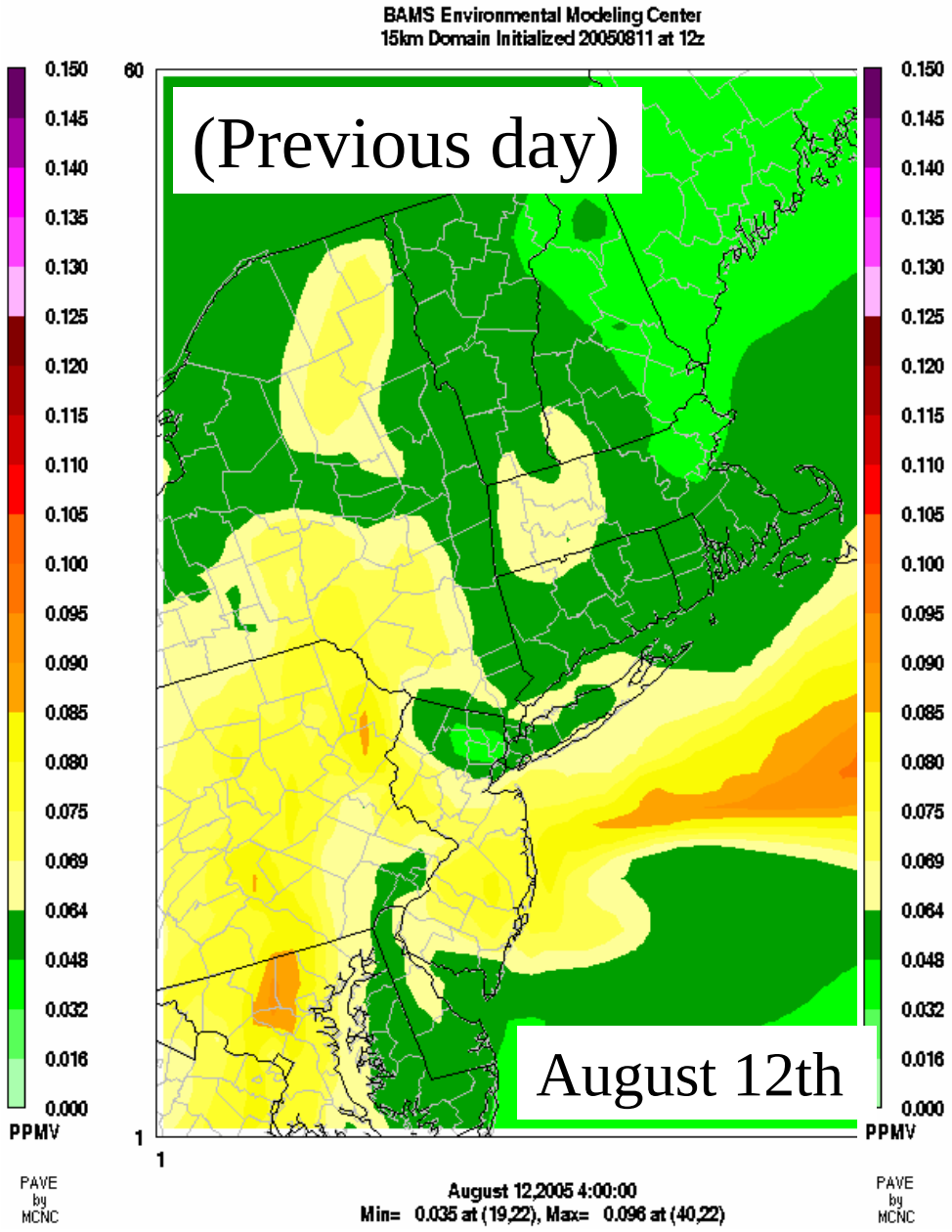
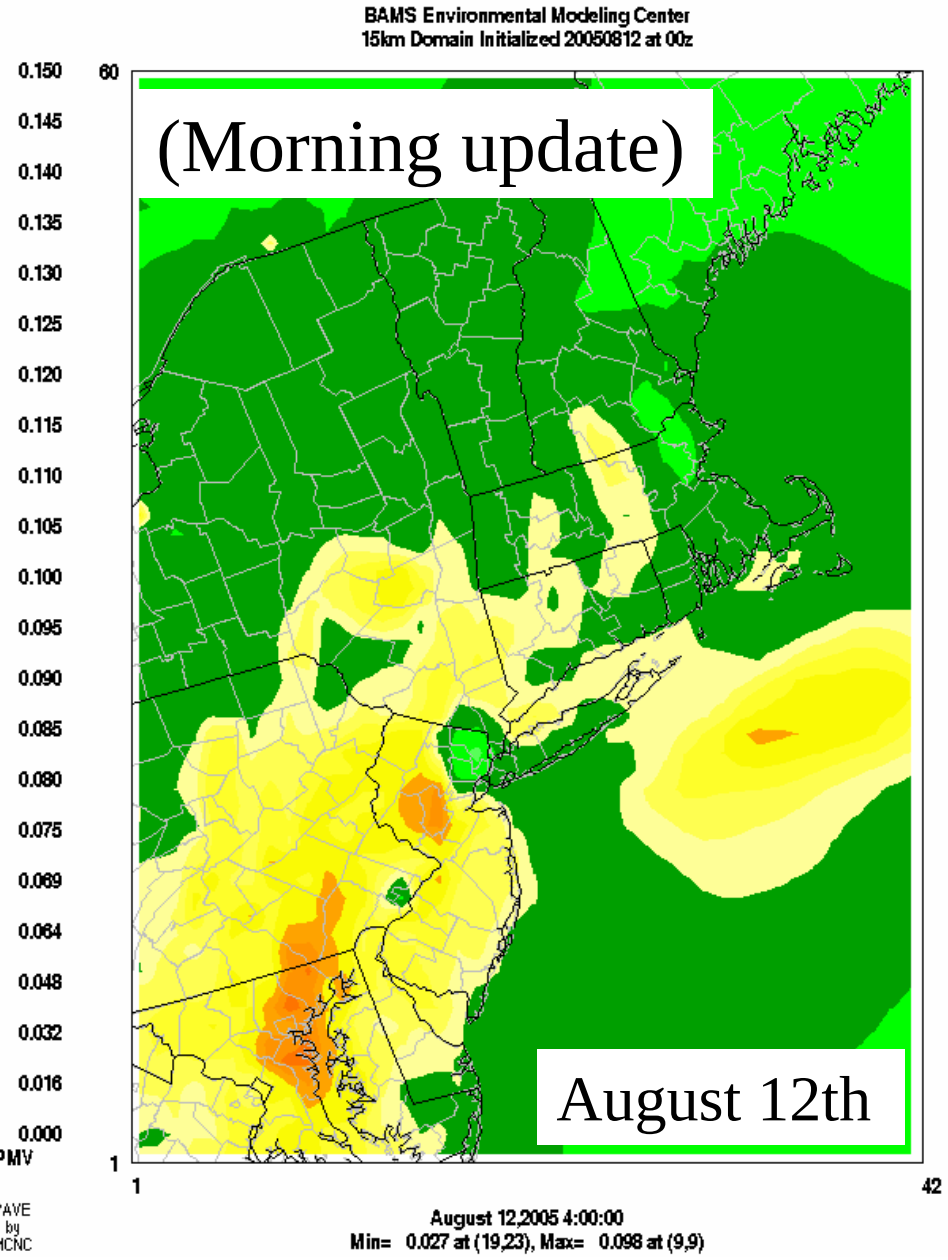
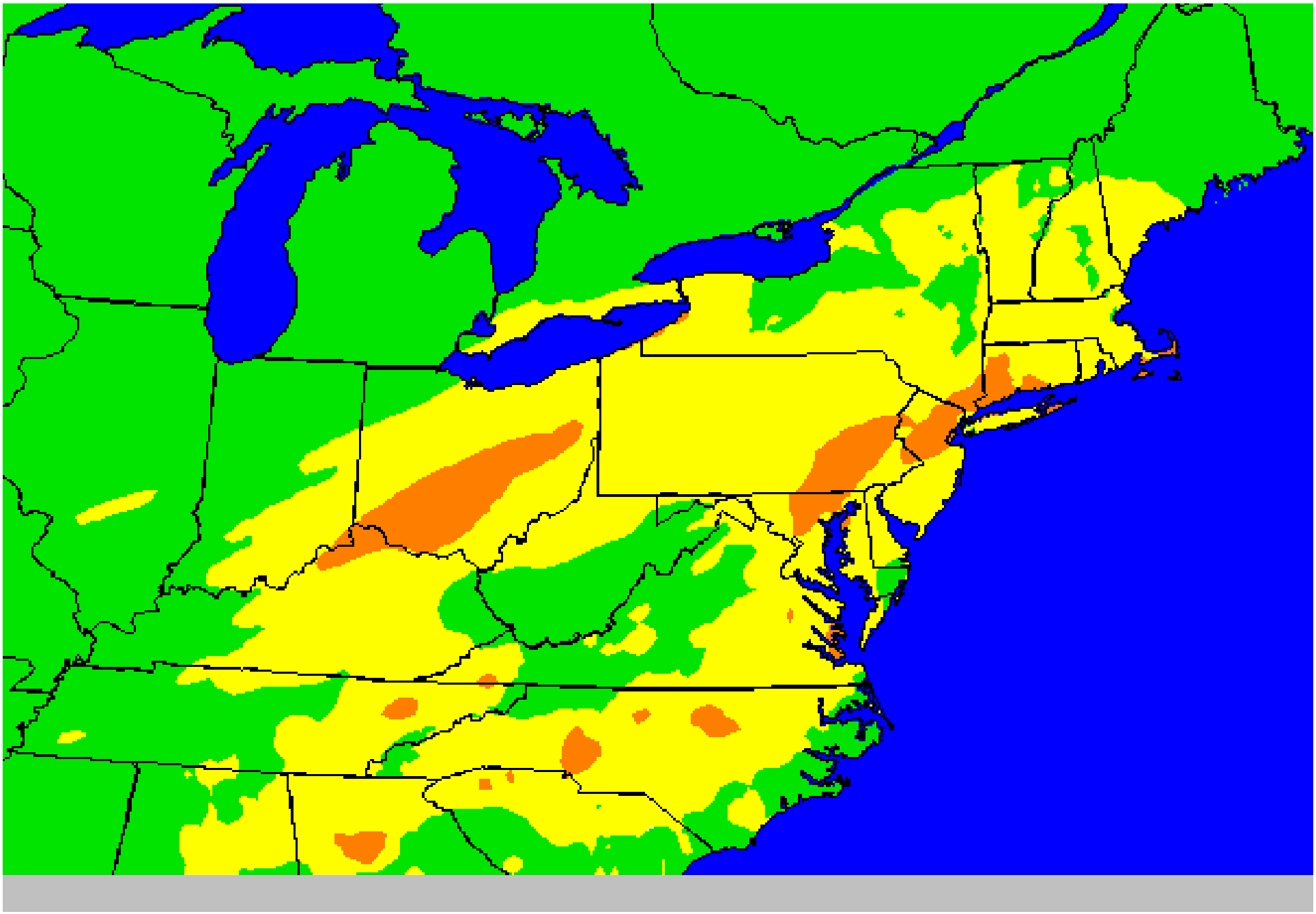
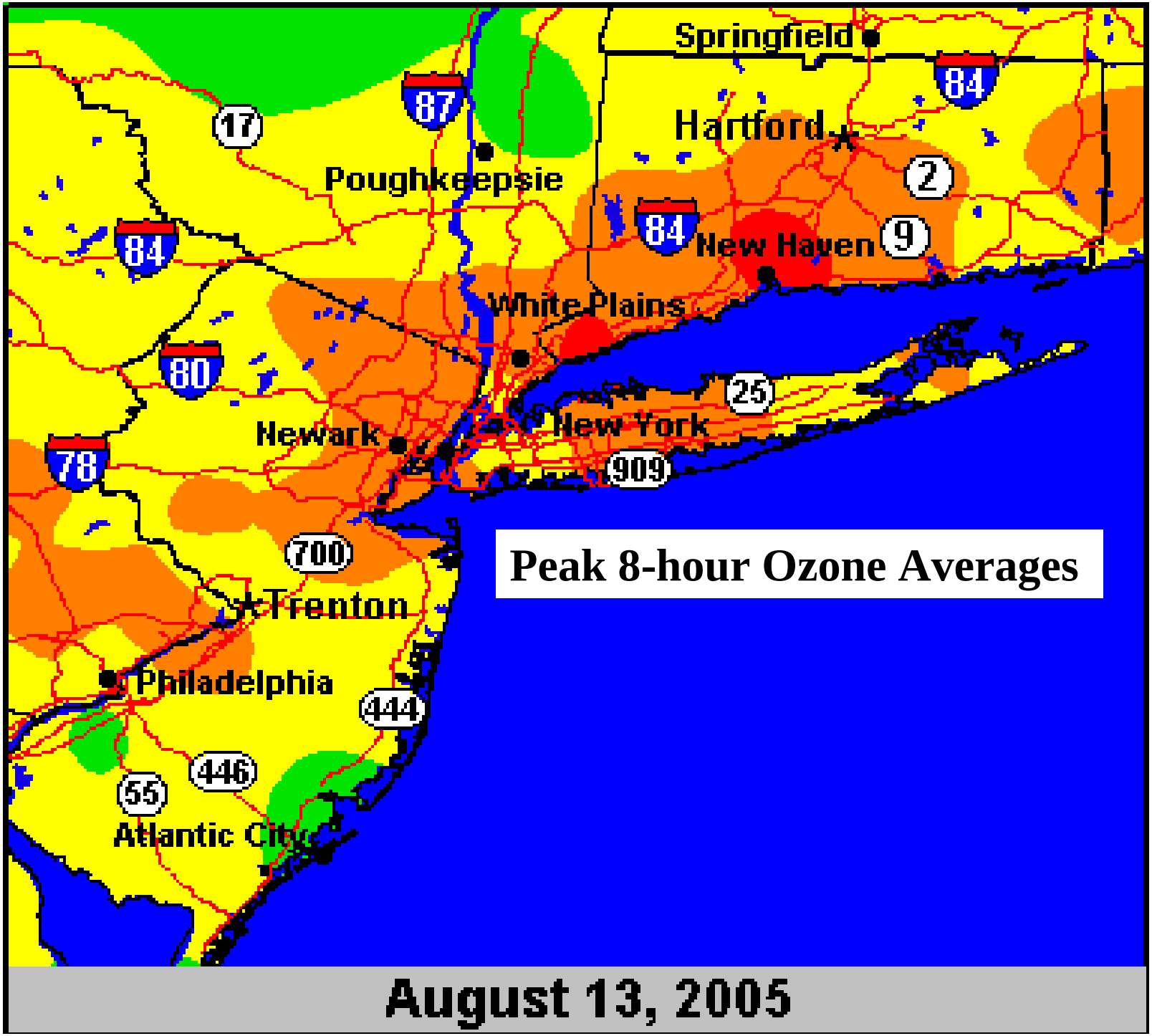


24HR Peak 8HR–AVE Ozone –– NE (NESCAUM) Corridor



Forecast for 8-hr peak (AQI) on 8/12/2005 (NWS model)

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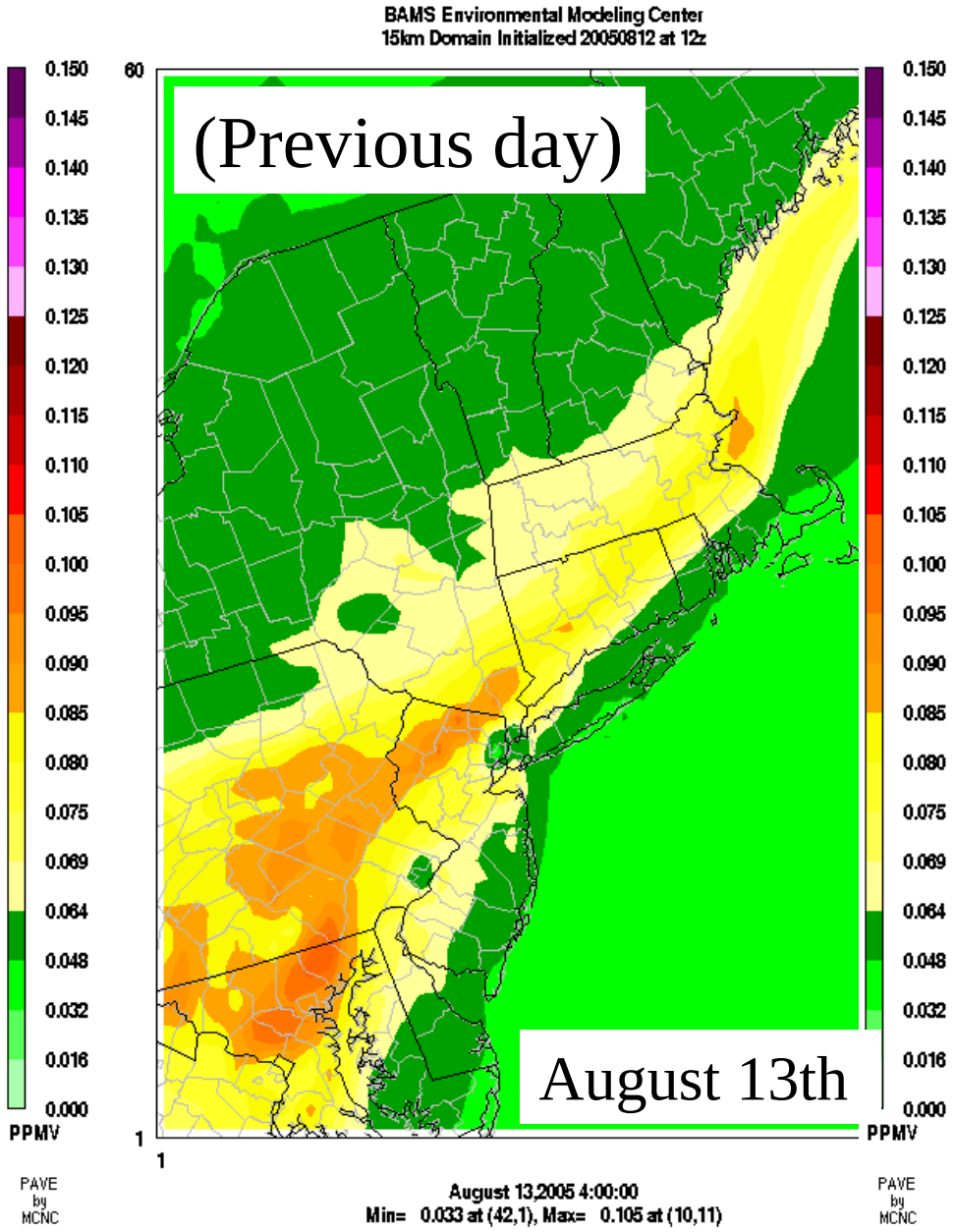
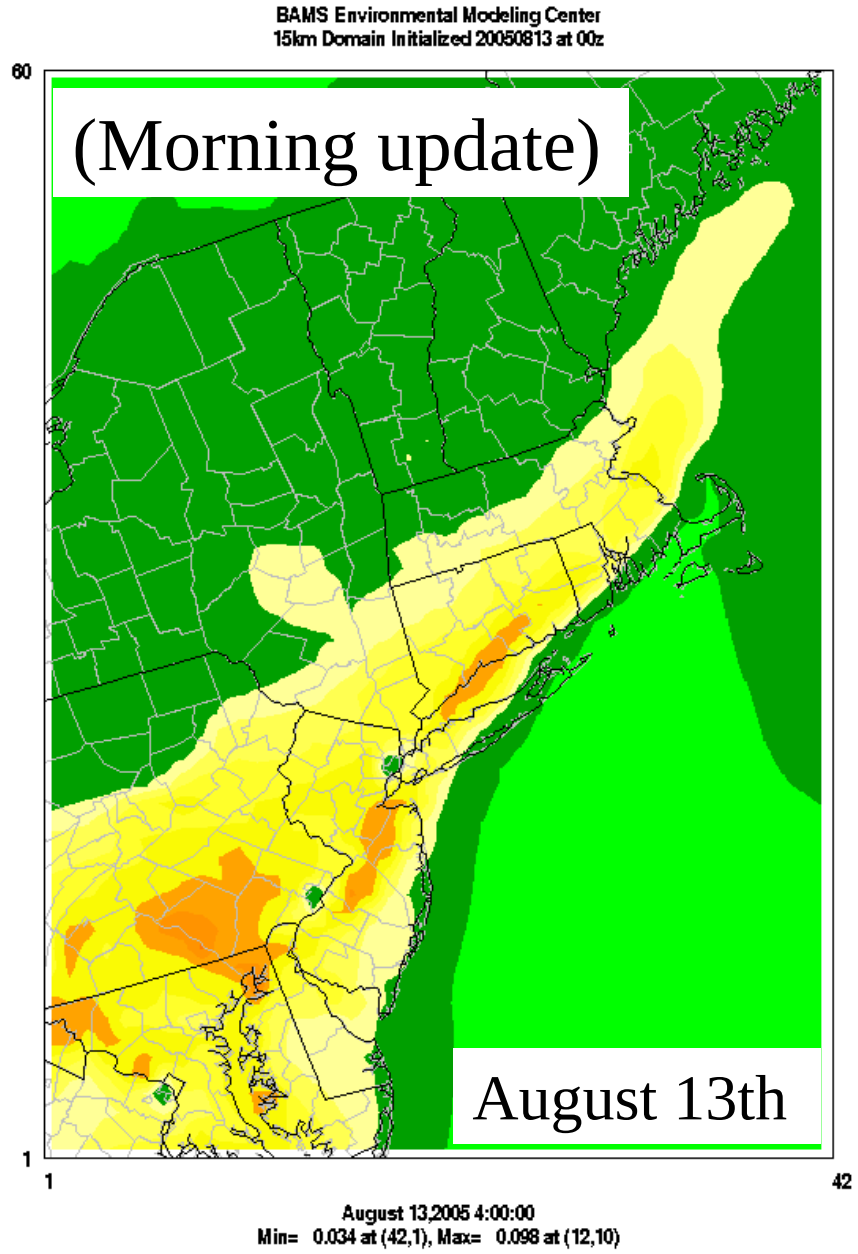
August 13, 2005

MAQSIP Model Predictions

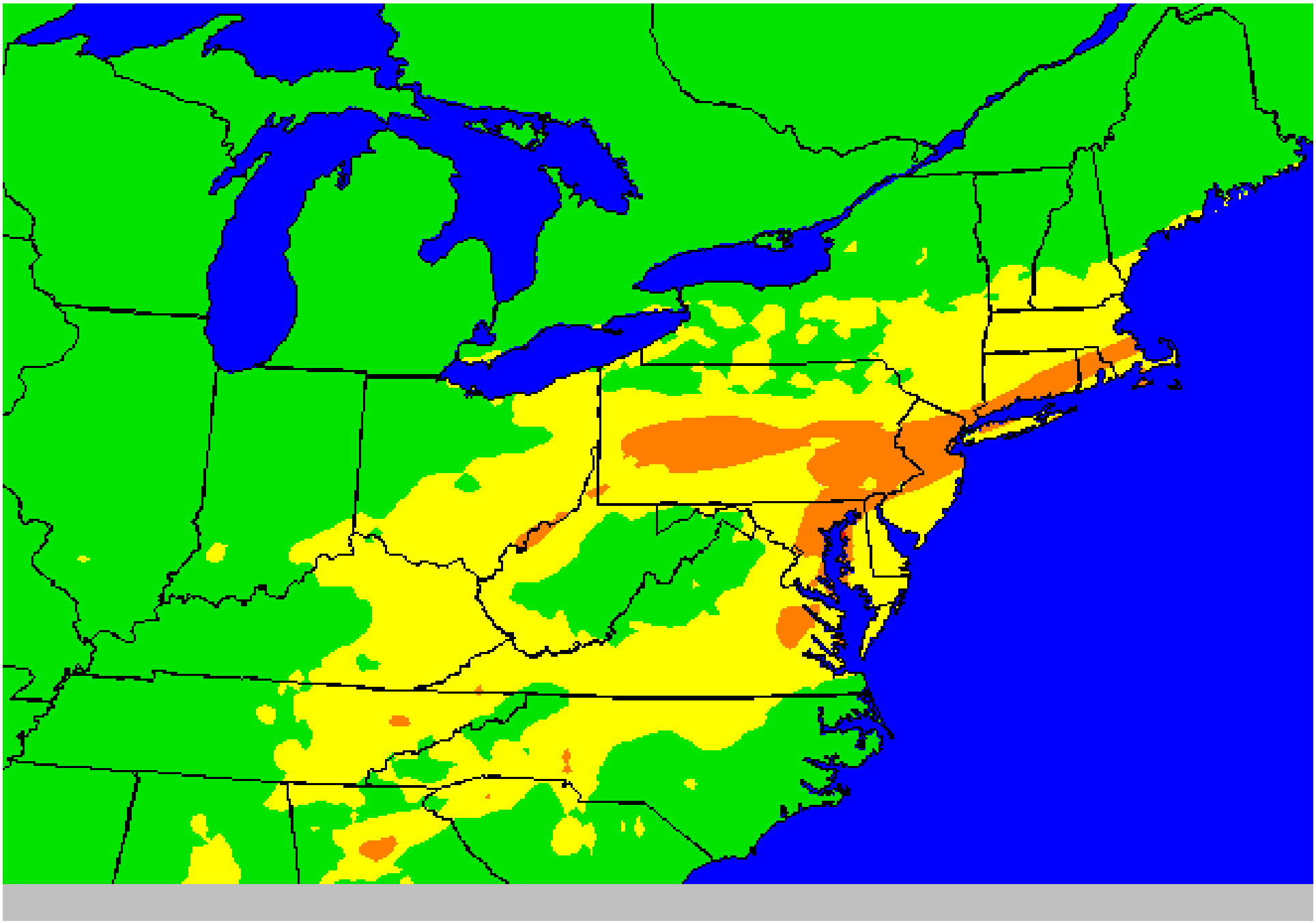
24HR Peak 8HR–AVE Ozone –– NE (NESCAUM



24HR Peak 8HR–AVE Ozone –– NE (NESCAUM) Corridor



Forecast for 8-hr peak (AQI) on 8/13/2005 (NWS model)



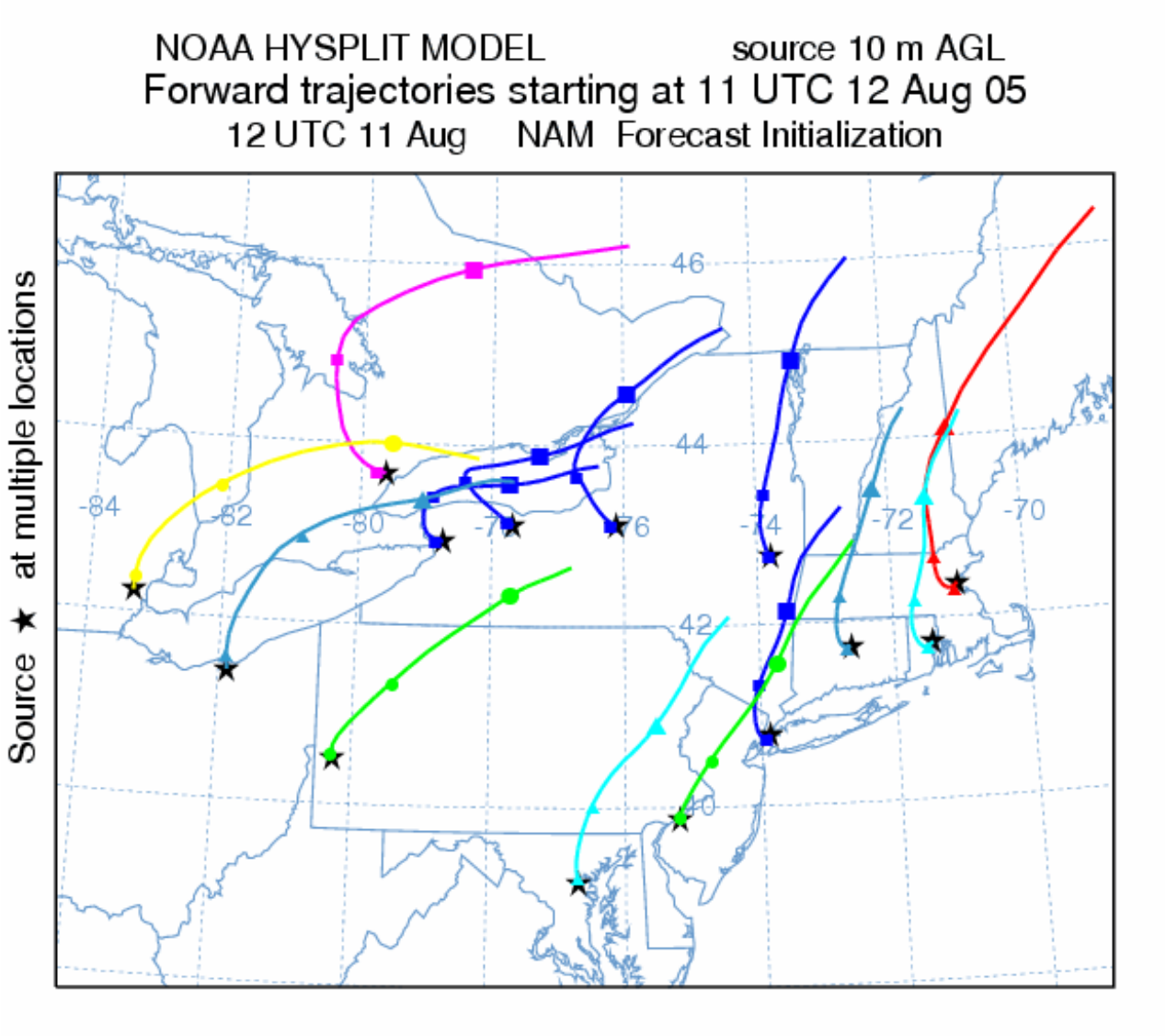
Model forecast comparison with DEP forecast (previous day) and verified ozone AQI levels

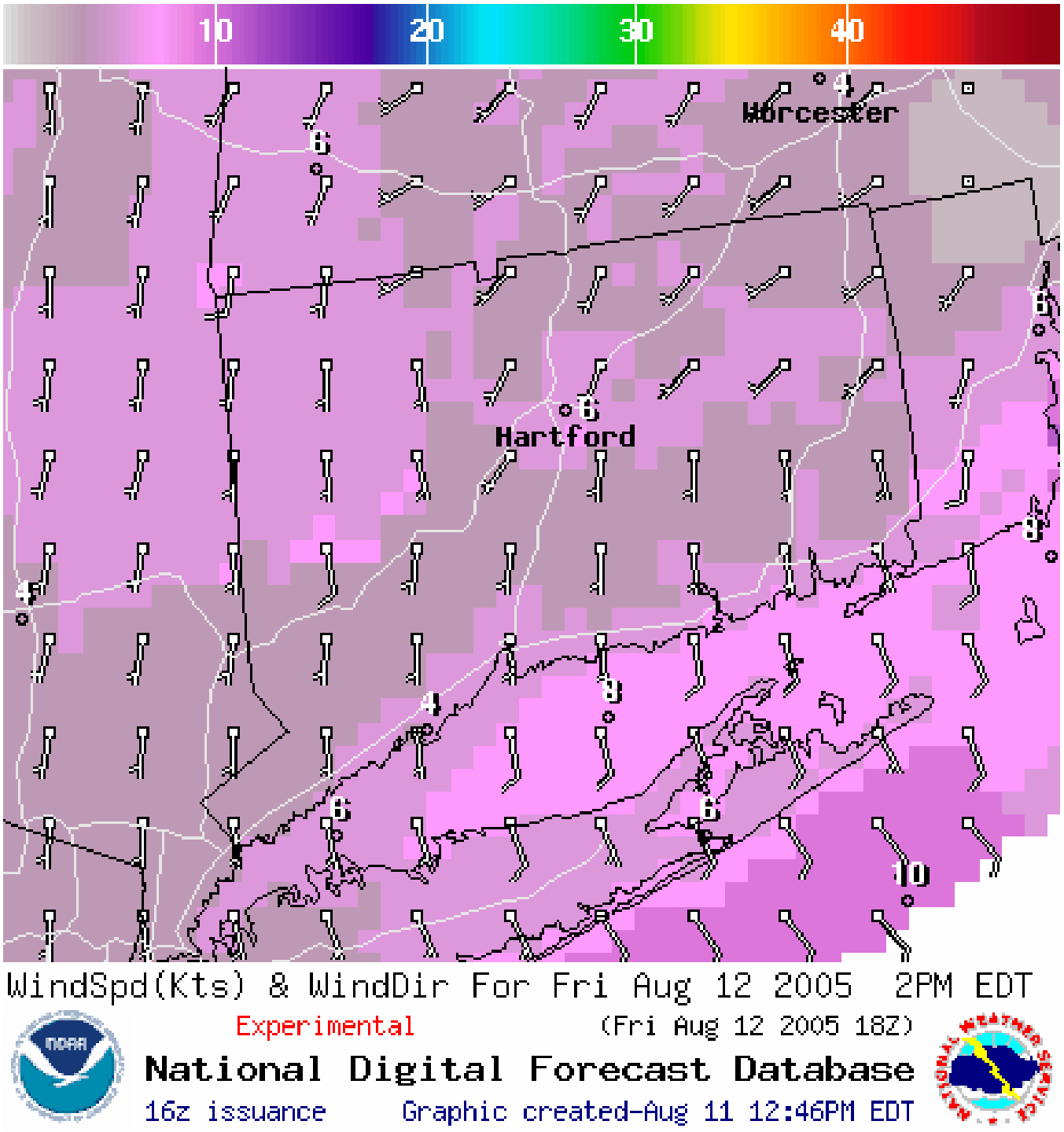
	August 11	August 12	August 13
Actual Ozone AQI	Good to **USG**	Moderate to **Unhealthy**	Moderate to **Unhealthy**
MAQSIP AQI (previous day)	Moderate to **USG**	Good to Moderate	Good to **USG**
NWS AQI (previous day)	Moderate to **USG**	Moderate to **USG**	Moderate to **USG**
DEP Forecast (previous day)	Good to **USG**	Moderate	Moderate to **USG**

Post Mortem

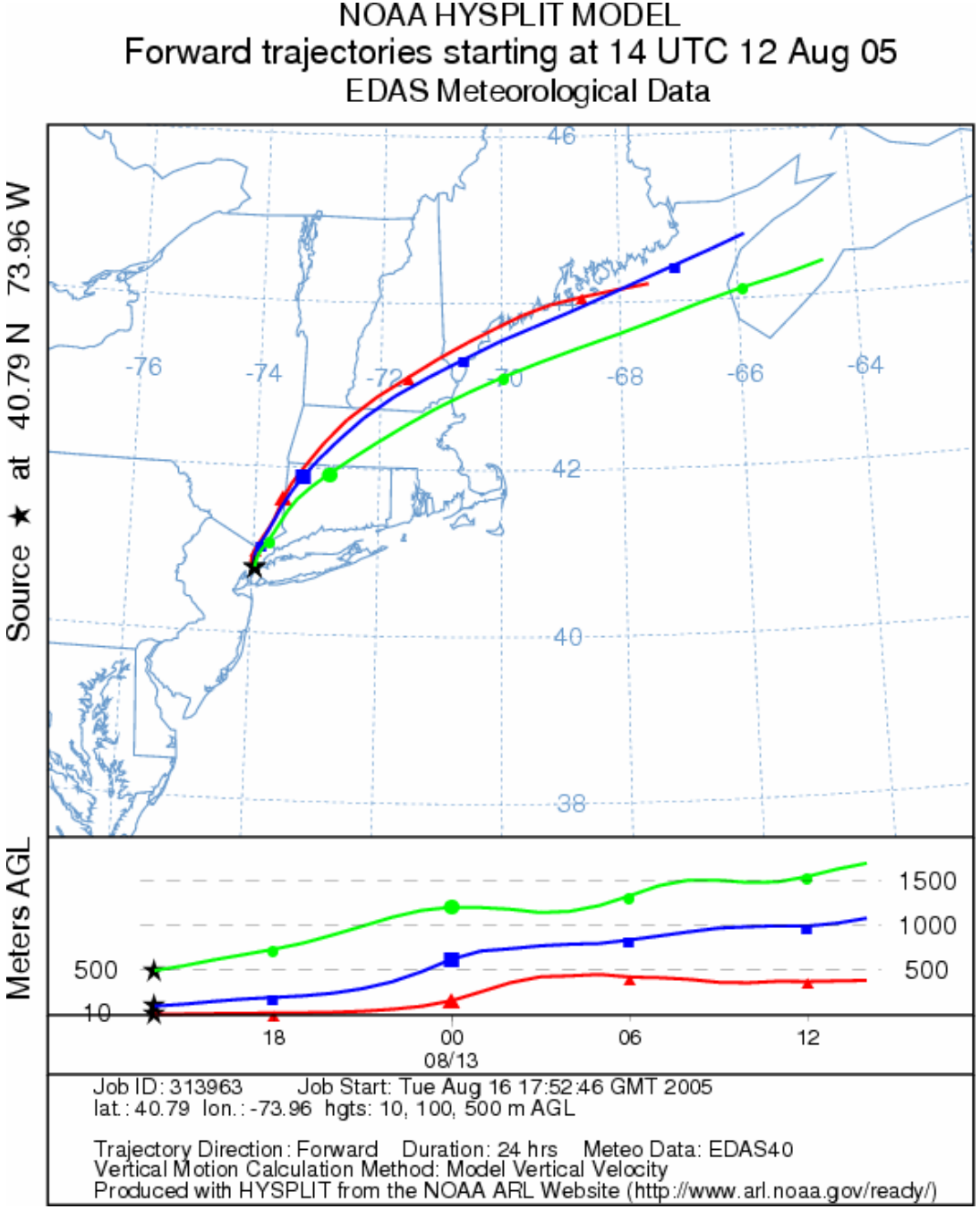
- The NWS model performed very well with the previous day forecast for this 3-day episode. The coverage was excellent, but it underestimated the **Unhealthy** levels on 2 days.
- The MAQSIP performed well on day 1, poorly on day 2, and fair on day 3.
- The DEP forecast was reasonably good for day 1 and day 3, however, neither of the models, nor the forecaster, predicted the Unhealthy levels on day 2 and 3.
- The day 2 DEP forecast went awry most likely because of the trajectory analysis that showed maritime air over-spreading the region. This scenario agreed with the MAQSIP forecast, which predicted only moderate ozone levels for day 2.

This analysis is heavily relied on by the forecasters, but was at conflict with the NWS model prediction.

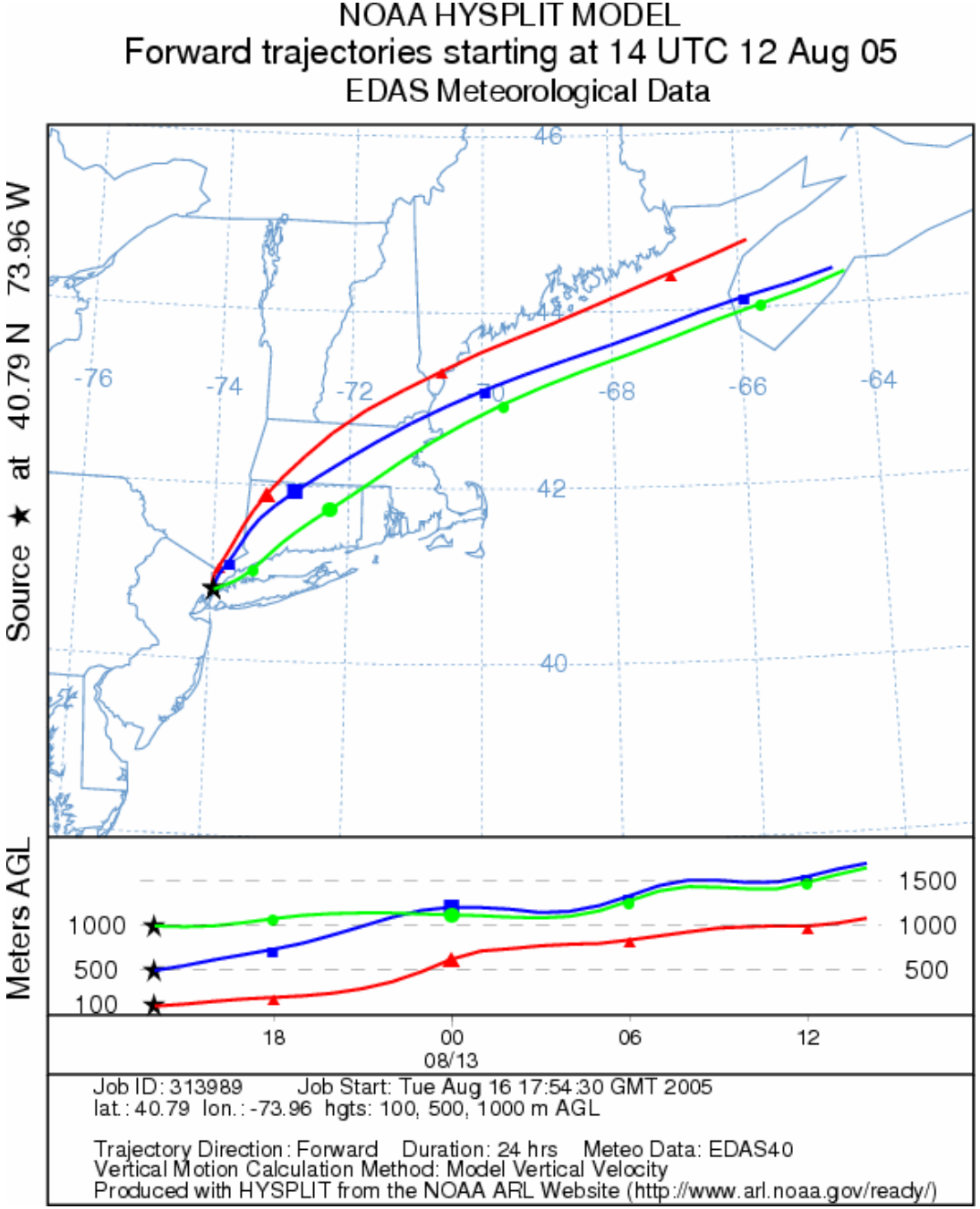




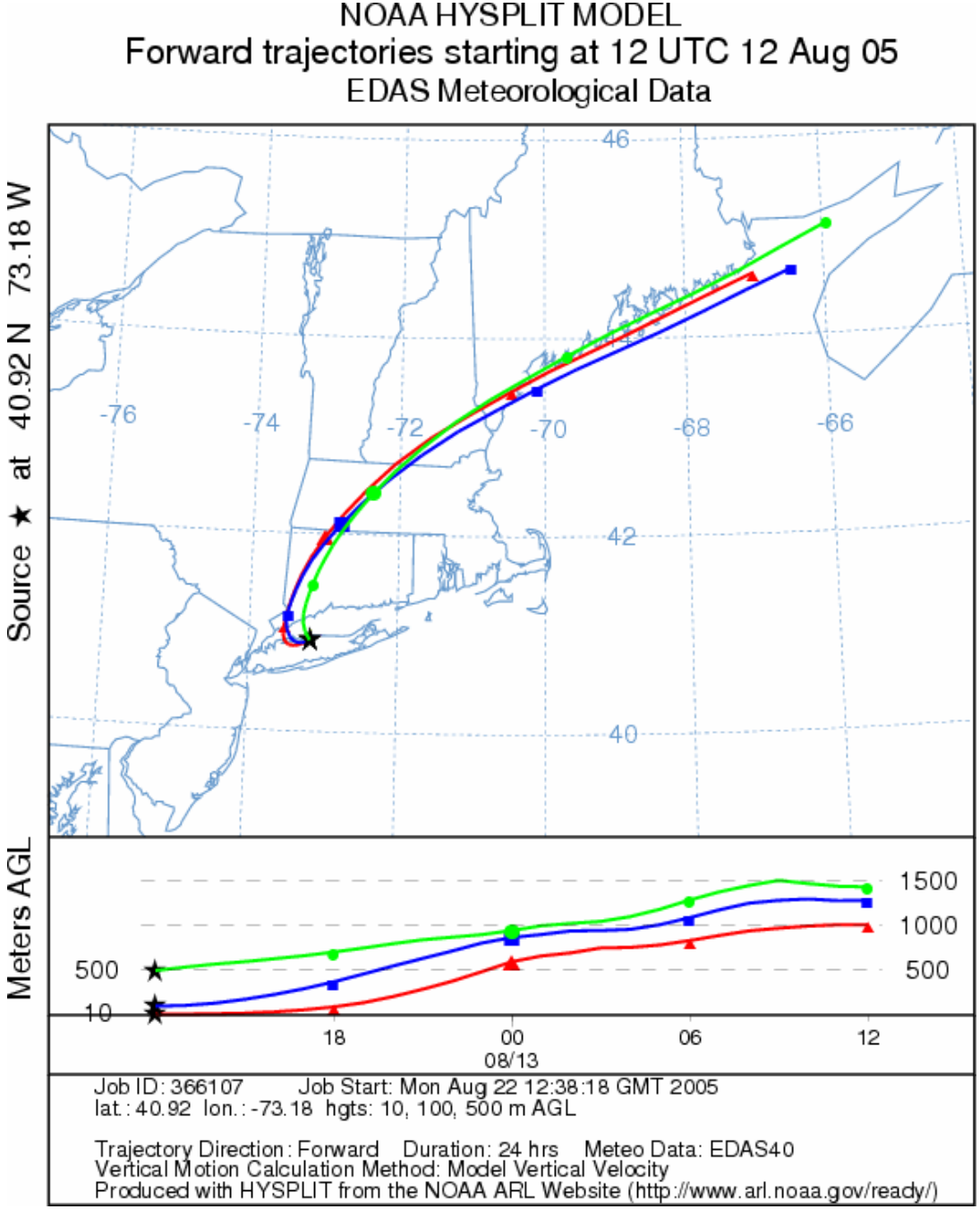
Likewise, the surface wind direction forecast was predicting conditions that usually only generates low to moderate levels of ozone.



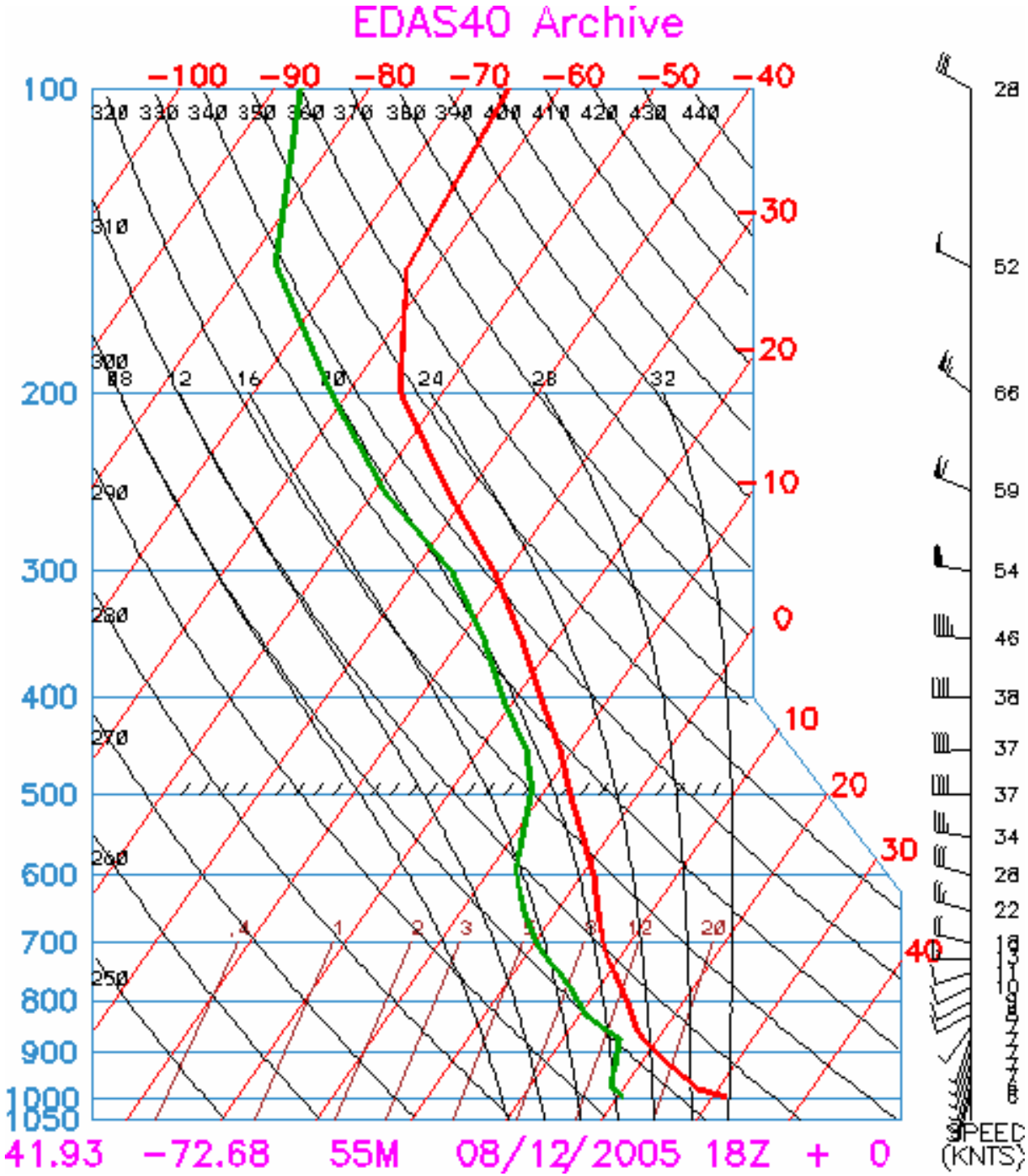
The actual trajectories (reanalysis) of air parcels from 10-500 meter elevations suggests that most Connecticut was bypassed by the New York City Plume.



However, when raising the elevation to 1000 meter, a northeast trajectory right over Connecticut is observed. I would speculate that a well mixed atmosphere could transport high levels of ozone and precursors downward during the day. This is probably what the NWS model was predicting.



Also of note are the forward trajectories off of Long Island, which experienced elevated levels of ozone the day before. This would contribute to the elevated ozone levels experienced on August 12th.



•A sounding for Bradley Airport shows the boundary layer extending to nearly 850 mb (>1km) for August 12th.

•In retrospect, model predictions must be more closely examined before they are discounted!

2005 Ozone Model Prediction Comparison for CT

Using analysis of categorical predictions for Connecticut*

Date	MAQSIP Category (Low to high range)		NWS Category (Low to high range)		Actual Category (Low to high range)	
April 20	N/A	N/A	N/A	N/A		
June 8			N/A**	N/A**		
June 9			N/A**	N/A**		
June 24						
June 25						
June 26						
July 19						
July 21						
July 22						
July 26						
July 27						
August 2						
August 3						
August 5						
August 11						
August 12						
August 13						

***Any occurrence of the mapped category within the State was included. Maps were produced by MAQSIP and NWS archives and actual categories were determined by AIRNOW forecast comparison maps. Previous day forecast model categories were used (from 12z update graphic).**

****** The NWS model was not functioning before June 13th 2005**

- **NWS model had an absolute category accuracy of 63%.**
- **NWS has an USG or greater (exceedance) forecast accuracy of 86% for those days with an actual exceedance (and when the model was functioning).**
- **NWS model predicted 19 exceedance days for Connecticut (since 6/13/05), or 7 false positives (37%) in addition to the 12 days that it correctly predicted exceedances.**