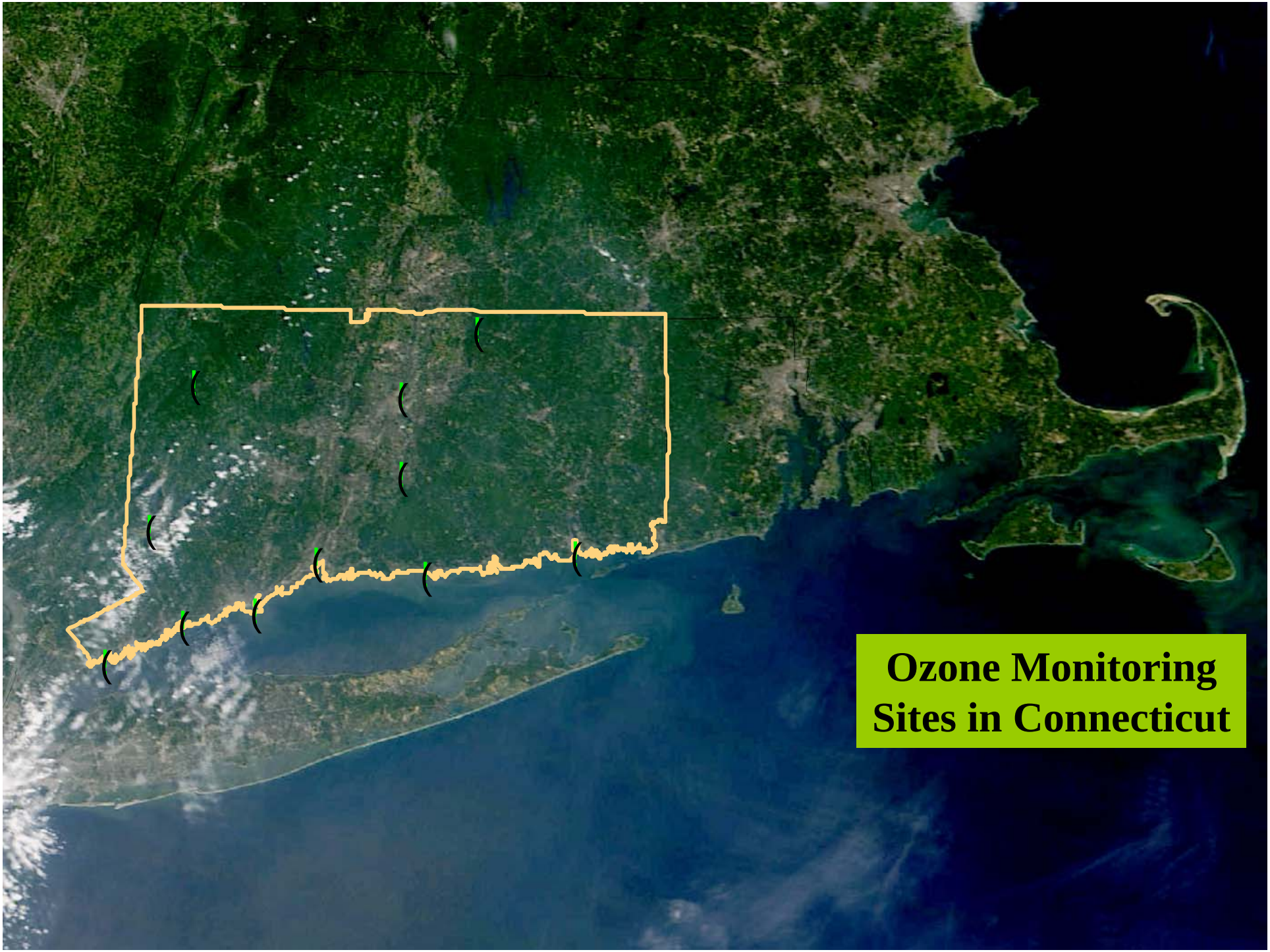
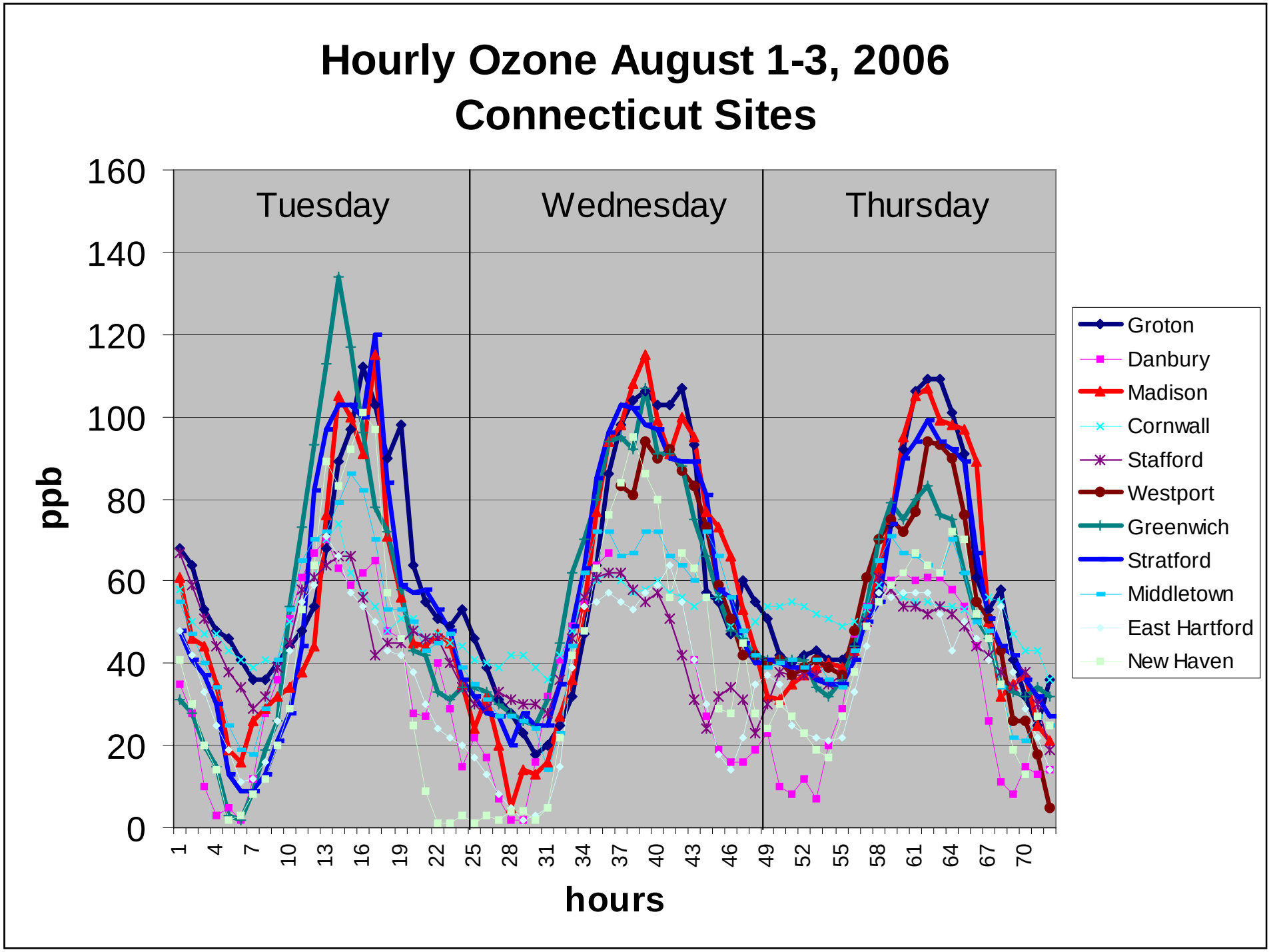
August 1-3, 2006 Connecticut Coastal Ozone Event


Ozone Monitoring
Sites in Connecticut

8-hr Ozone Maximums (ppb)

	August 1, 2006	August 2, 2006	August 3, 2006
Groton	90	100	102
Danbury	62	51	58
Madison	82	100	95
Cornwall	60	58	55
Stafford	57	57	54
Westport	--	87	80
Greenwich	97	92	75
Stratford	93	95	87
Middletown	72	68	65
East Hartford	56	56	53
New Haven	79	75	63

8-hour ozone exceedances only reported at the coastal locations, despite the major heat-wave experienced in the interior of Connecticut.


Hourly Ozone August 1-3, 2006
Connecticut Sites
Tuesday
Wednesday
Thursday
ppb
hours
0
20
40
60
80
100
120
140
160
1
4
7
10
13
16
19
22
25
28
31
34
37
40
43
46
49
52
55
58
61
64
67
70
Groton
Danbury
Madison
Cornwall
Stafford
Westport
Greenwich
Stratford
Middletown
East Hartford
New Haven

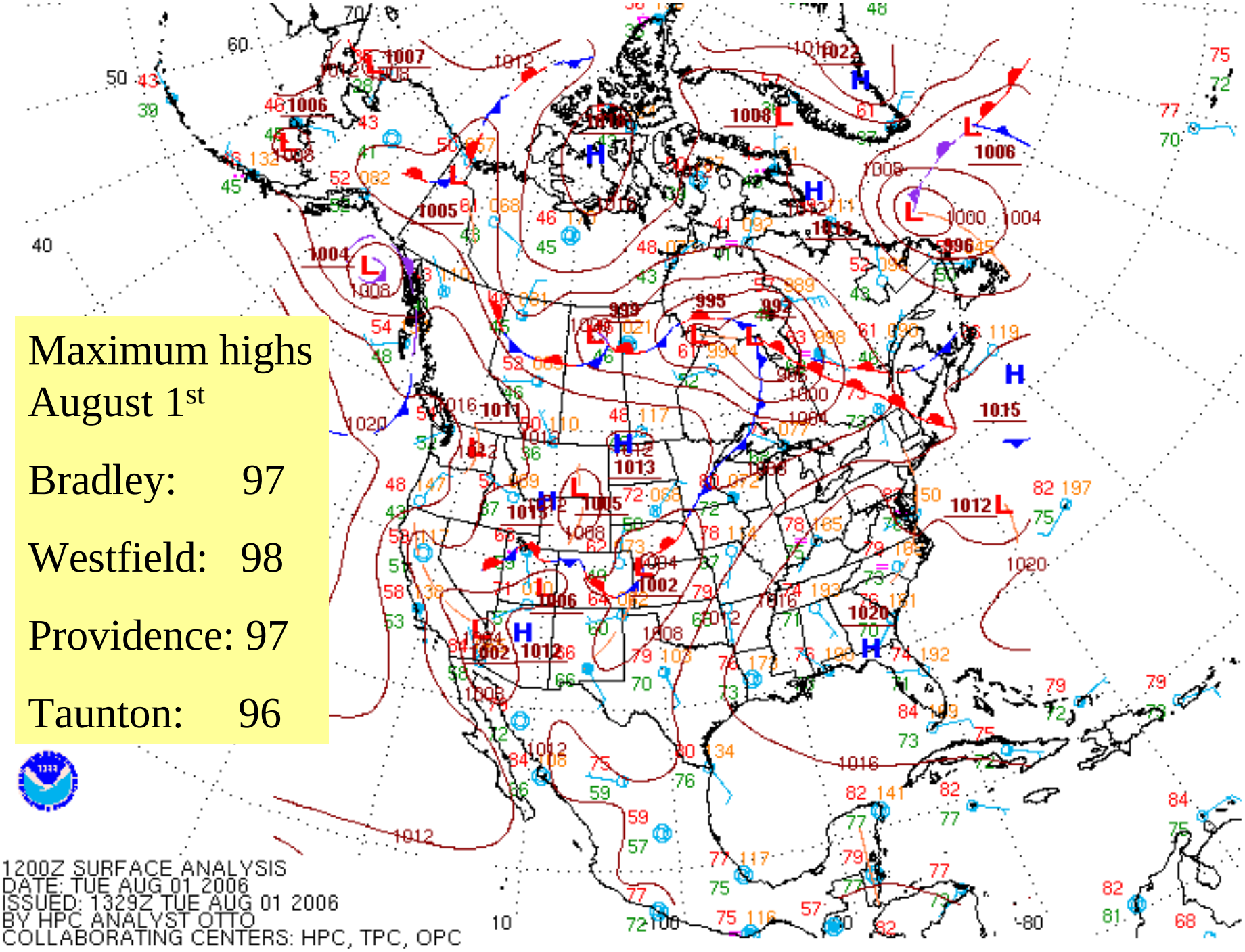
Maximum highs
August 1st

Bradley: 97

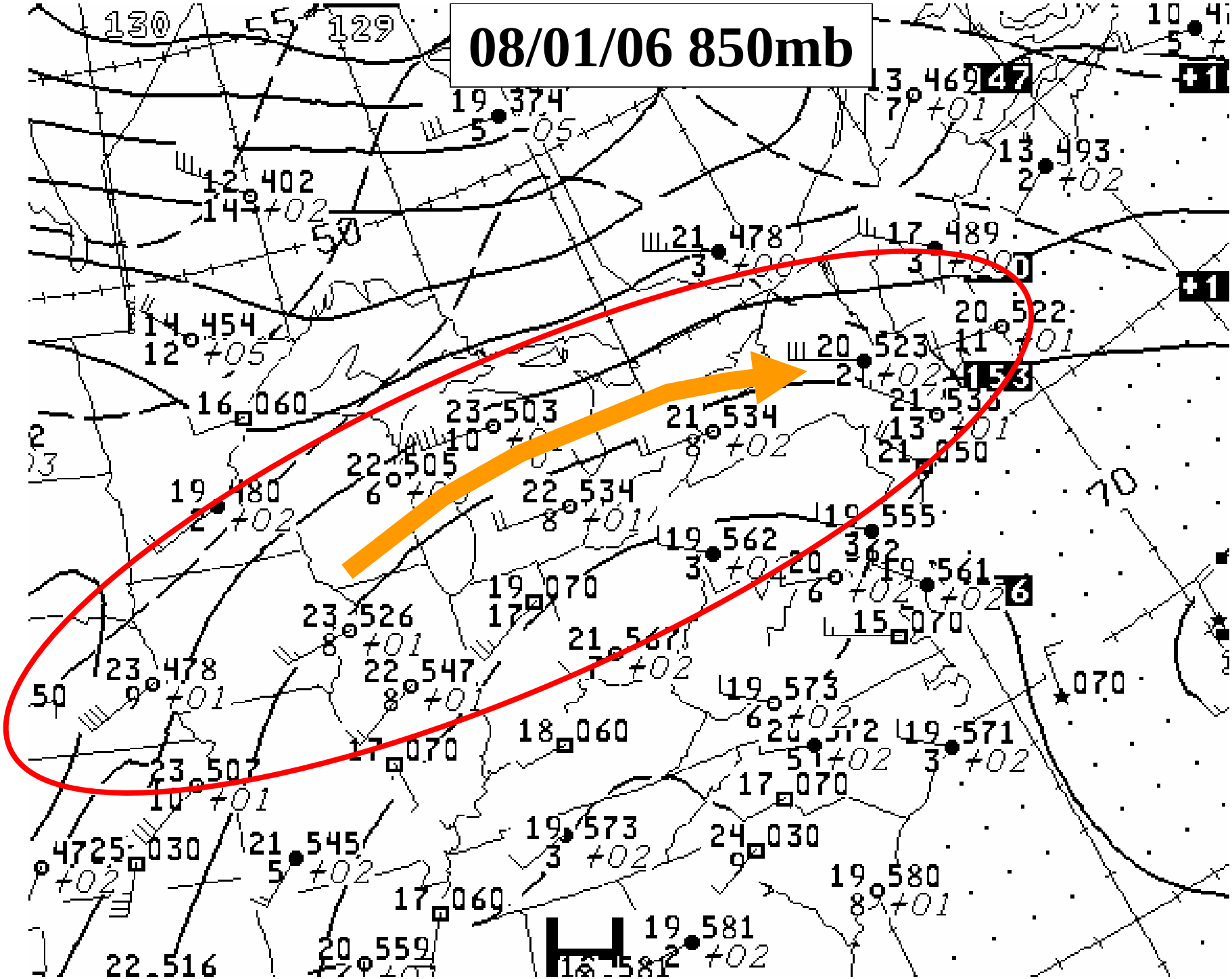
Westfield: 98

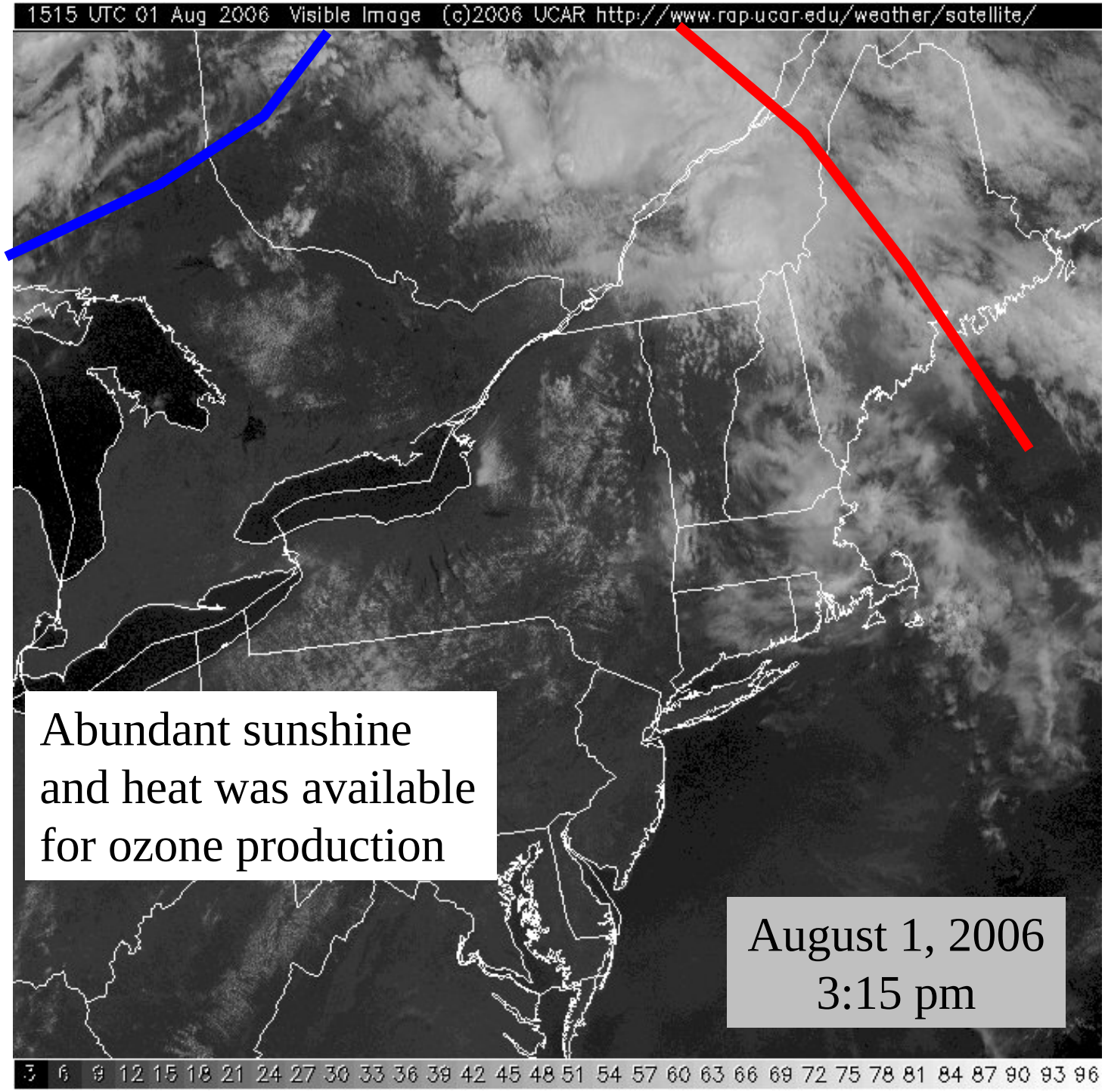
Providence: 97

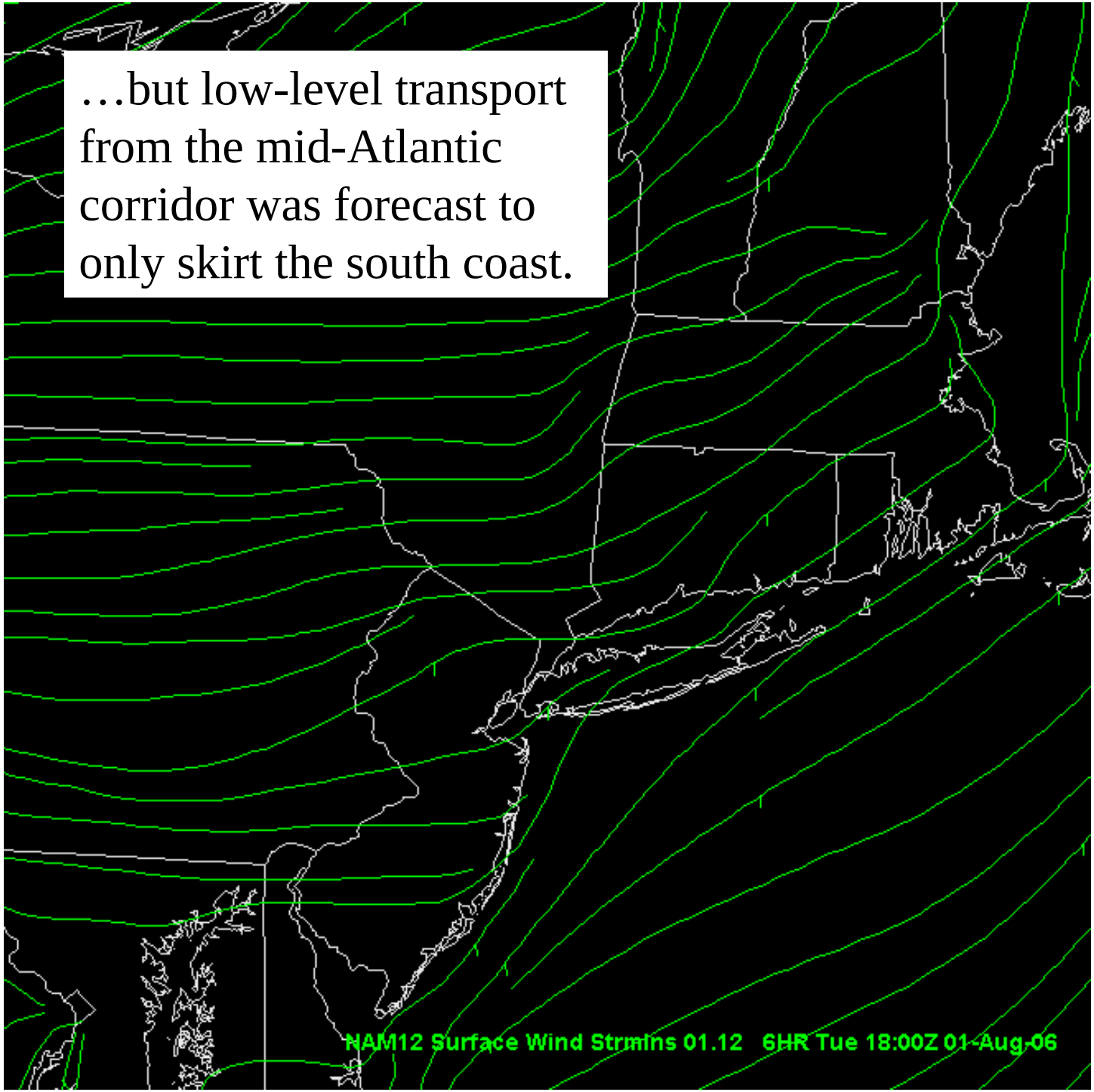
Taunton: 96



08/01/06 850mb



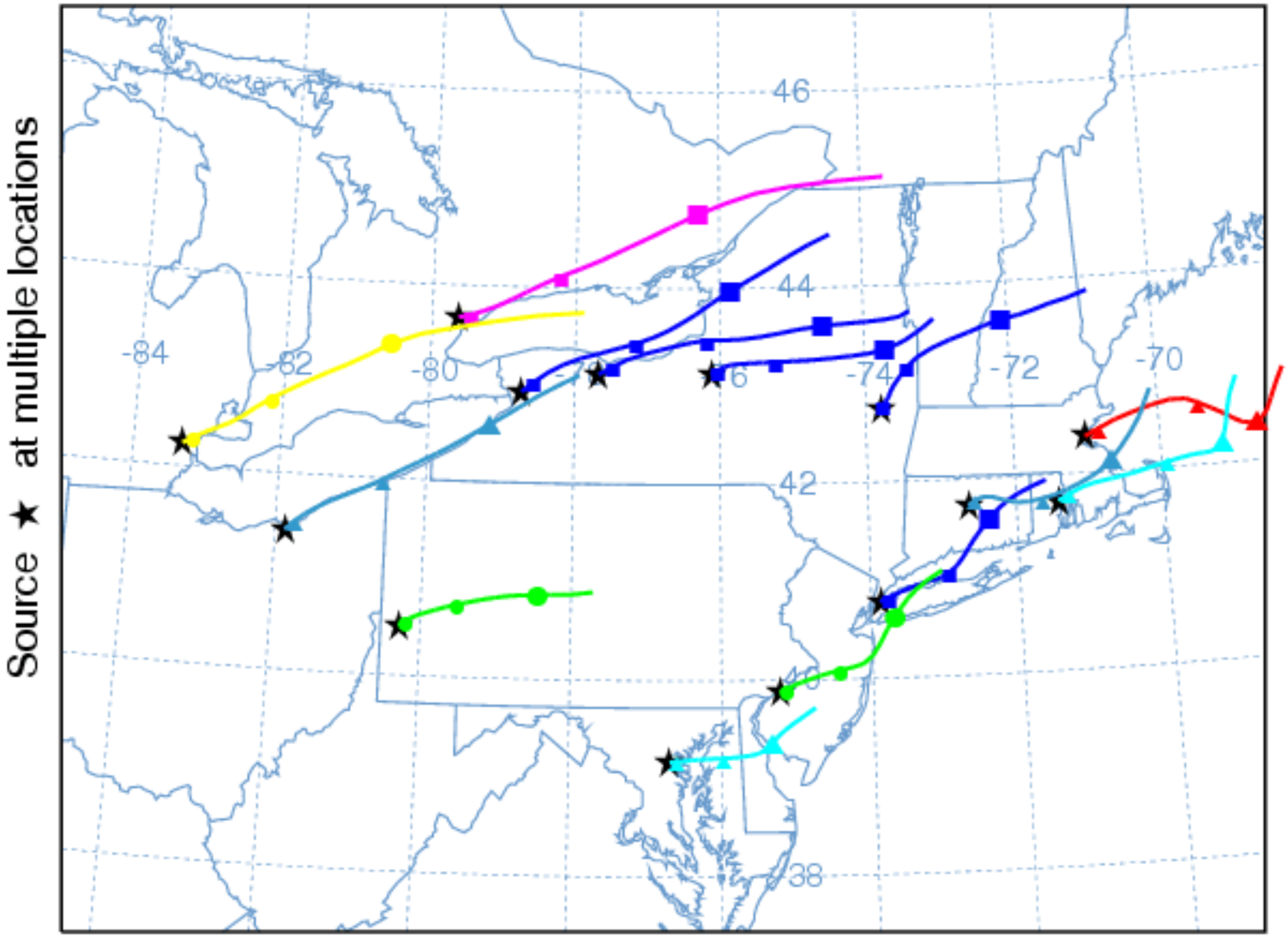

1515 UTC 01 Aug 2006 Visible Image (c)2006 UCAR http://www.rap.ucar.edu/weather/satellite/
Abundant sunshine and heat was available for ozone production
August 1, 2006
3:15 pm
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78 81 84 87 90 93 96

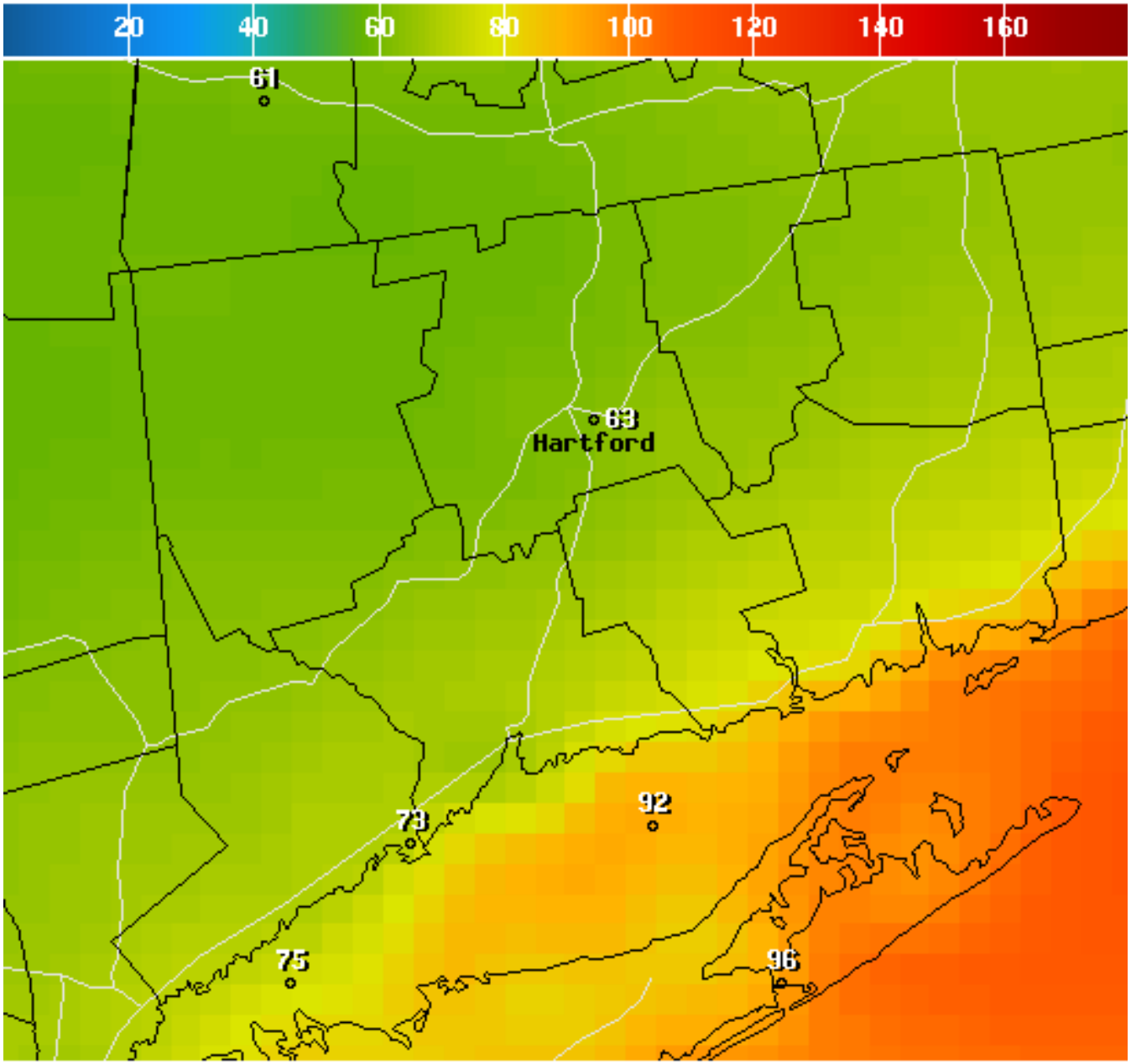

…but low-level transport from the mid-Atlantic corridor was forecast to only skirt the south coast.
NAM12 Surface Wind Strmlns 01.12 6HR Tue 18:00Z 01-Aug-06

NOAA HYSPLIT MODEL source 10 m AGL

Forward trajectories starting at 11 UTC 01 Aug 06

12 UTC 31 Jul NAM Forecast Initialization





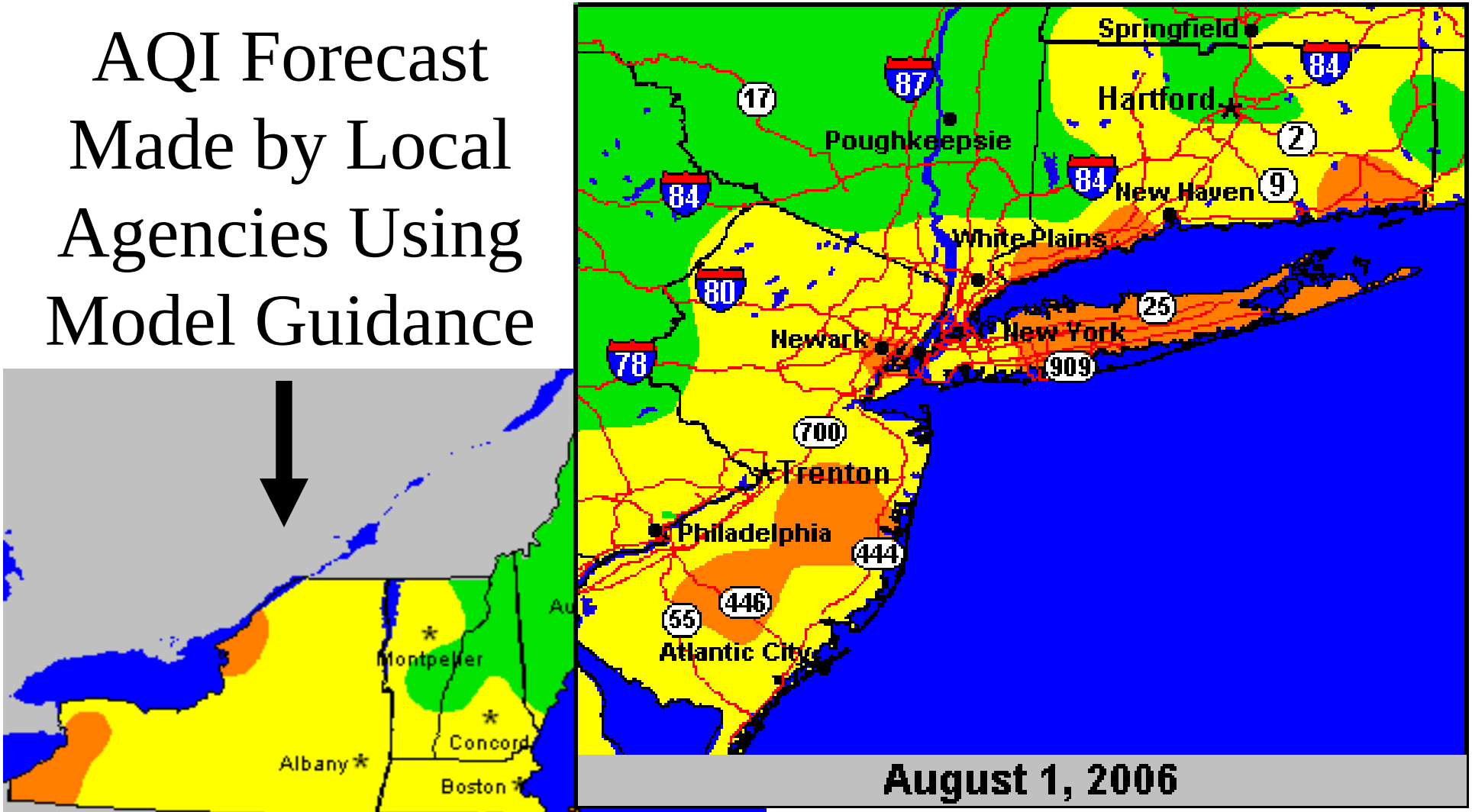
8Hr Avg Ozone Concentration(PPB) Ending Tue Aug 01 2006 8PM EDT

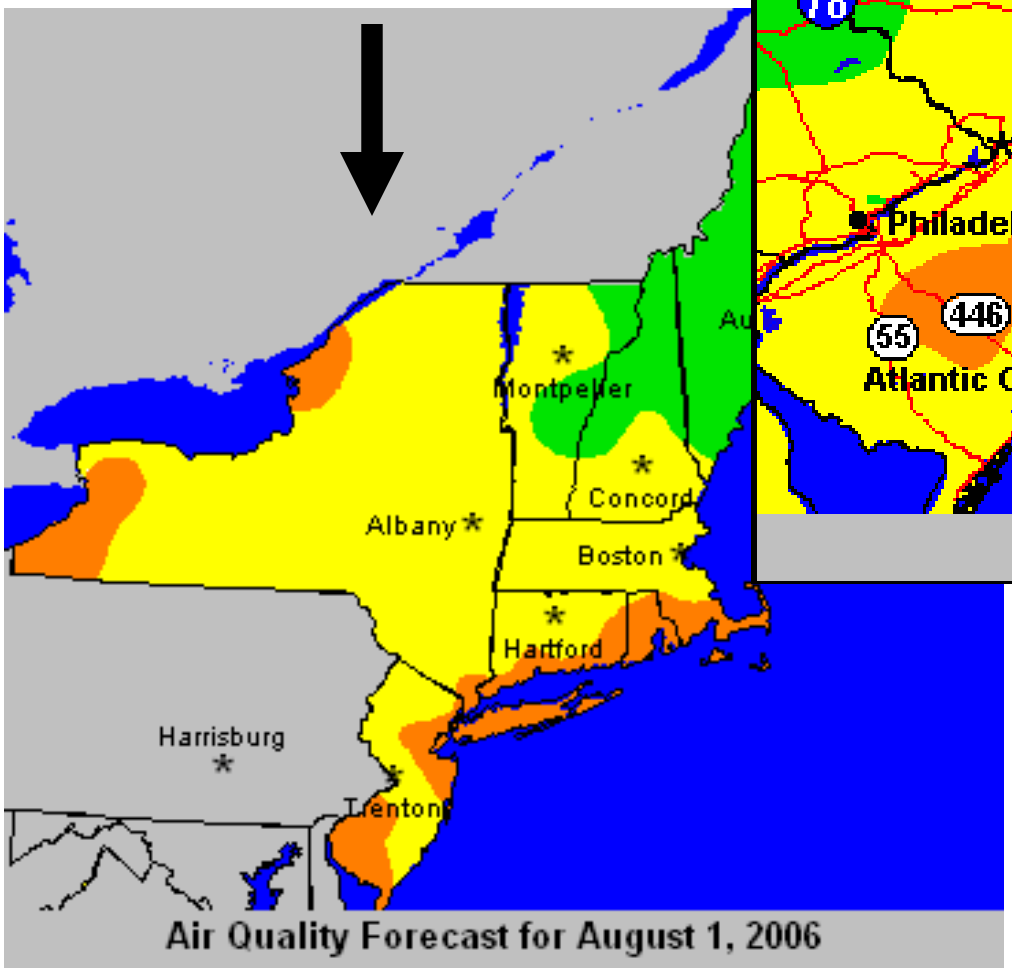
(Wed Aug 02 2006 00Z)

National Digital Guidance Database

06z model run Graphic created-Aug 01 7:27AM EDT

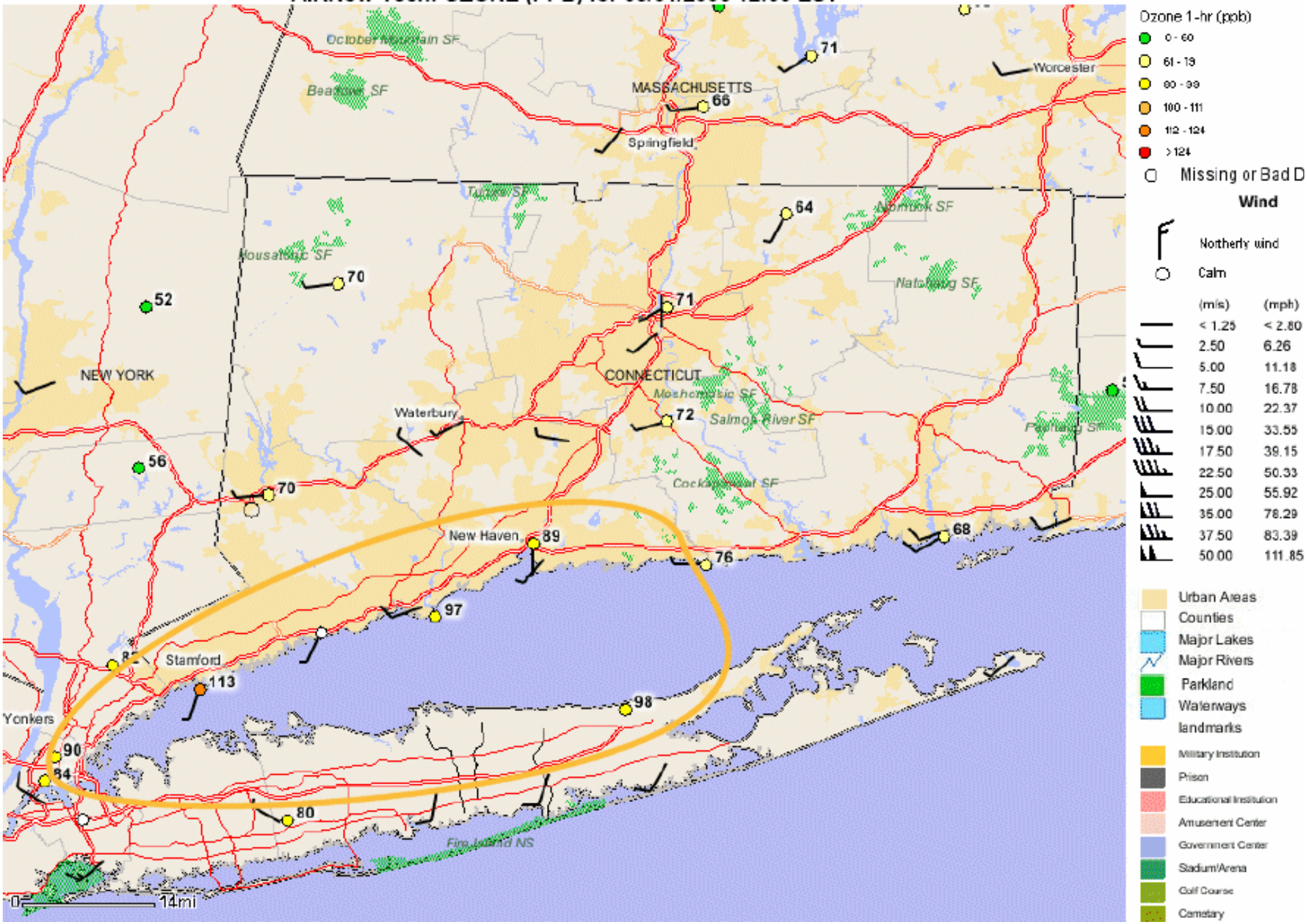
AQI Forecast Made by Local Agencies Using Model Guidance





NOAA model missed SW CT, but accurately forecast Long Island

AIRNow-Tech: OZONE (PPB) for 08/01/2006 12:00 EST



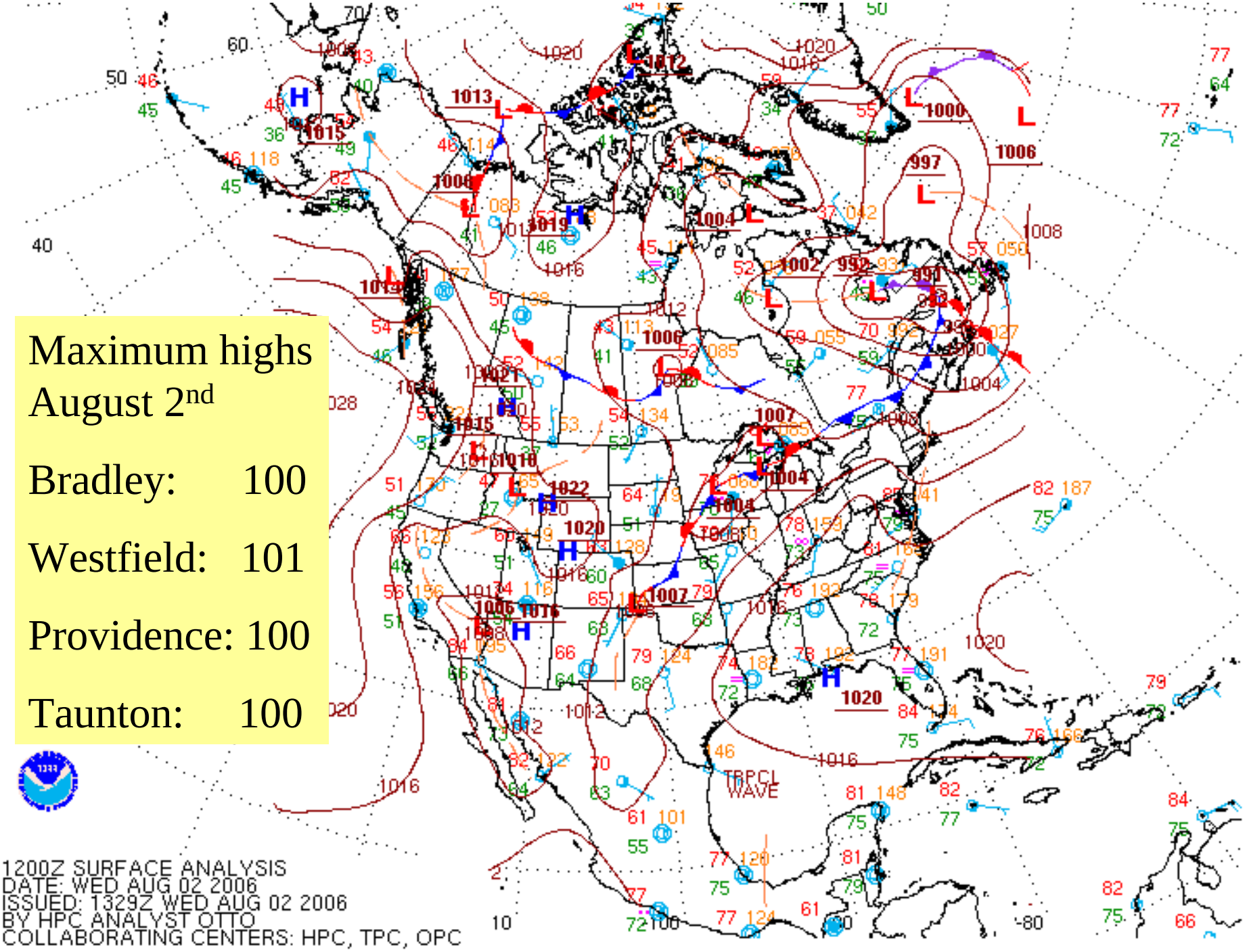
Maximum highs
August 2nd

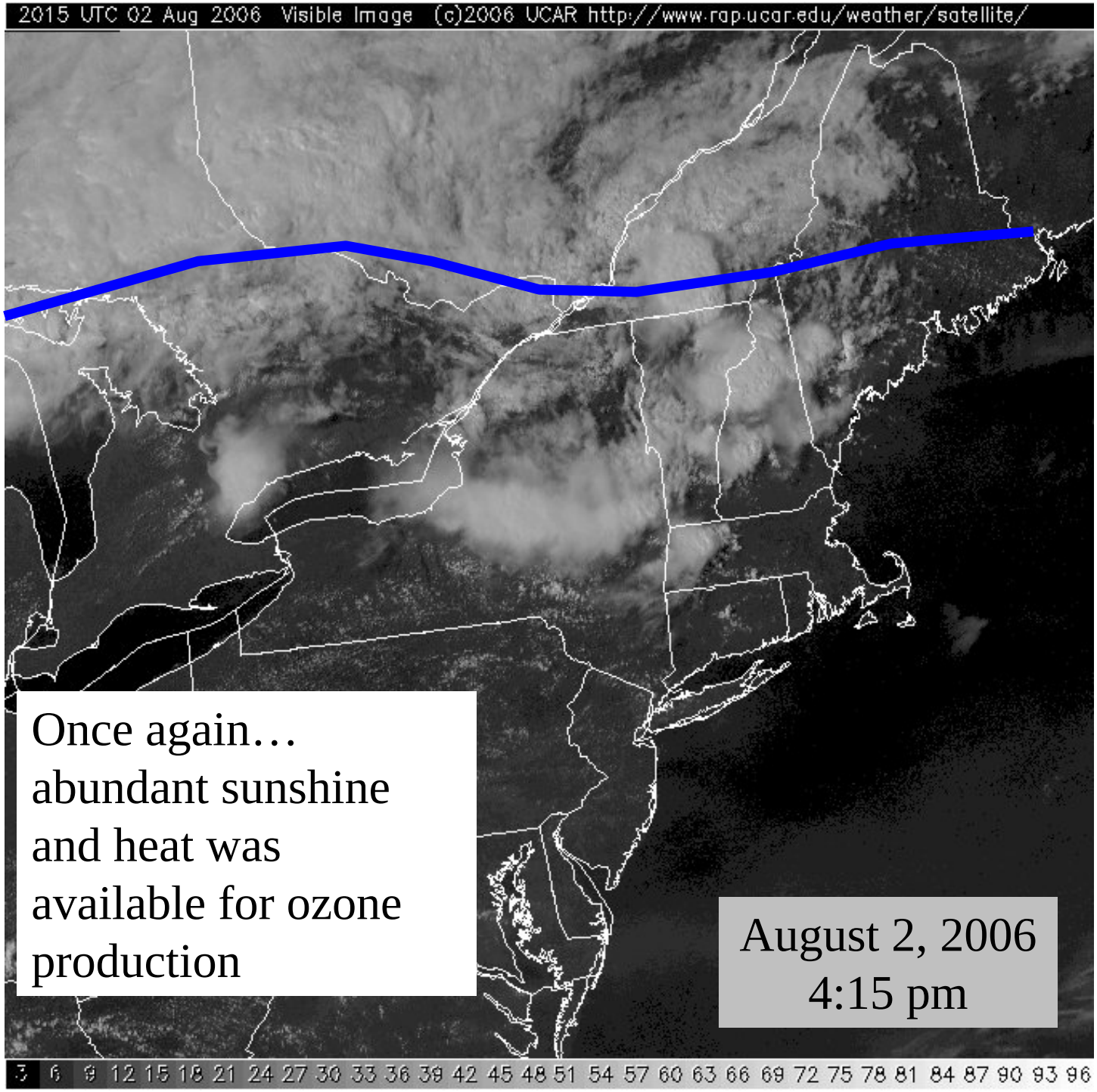
Bradley: 100

Westfield: 101

Providence: 100

Taunton: 100

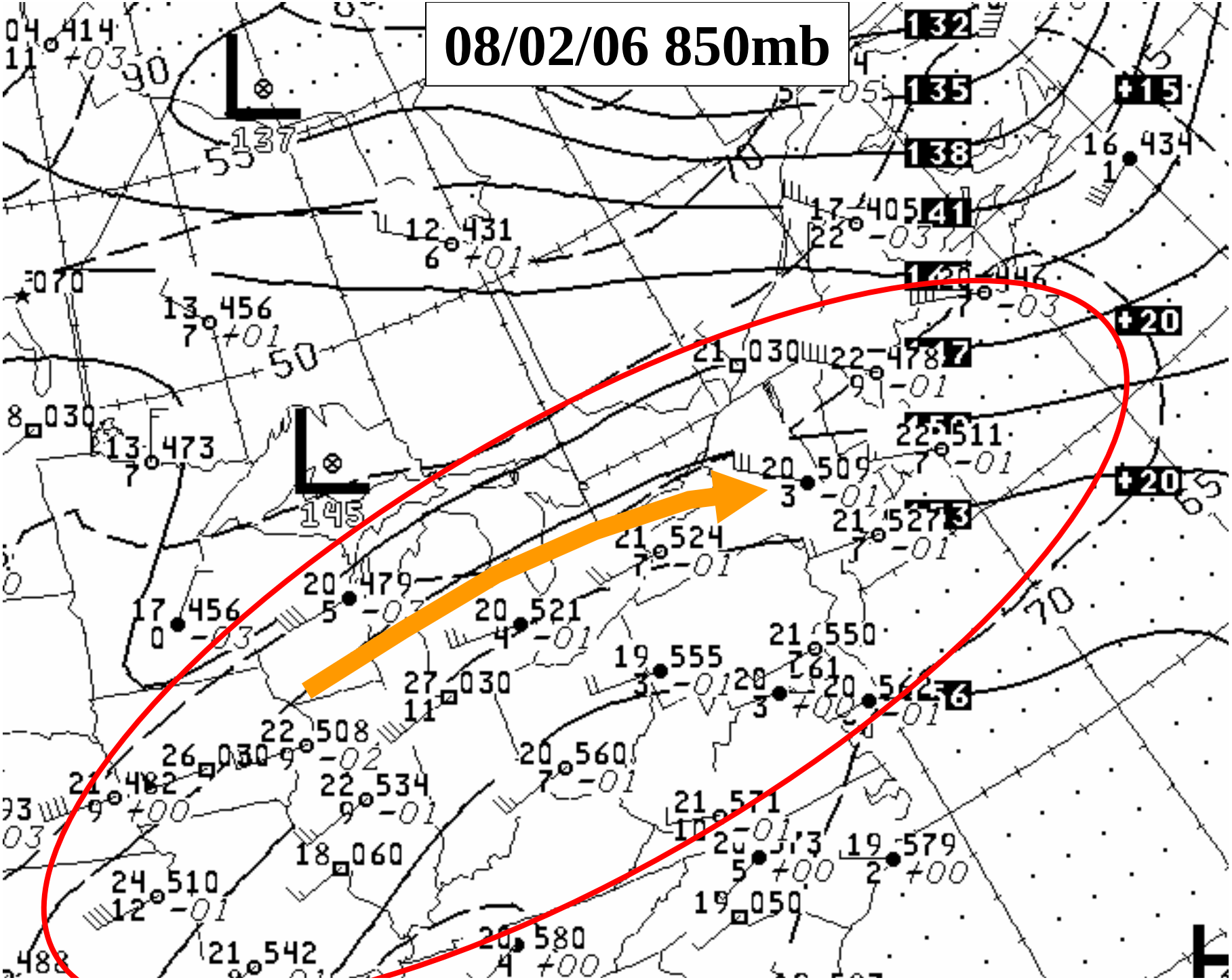




Once again… abundant sunshine and heat was available for ozone production

August 2, 2006
4:15 pm

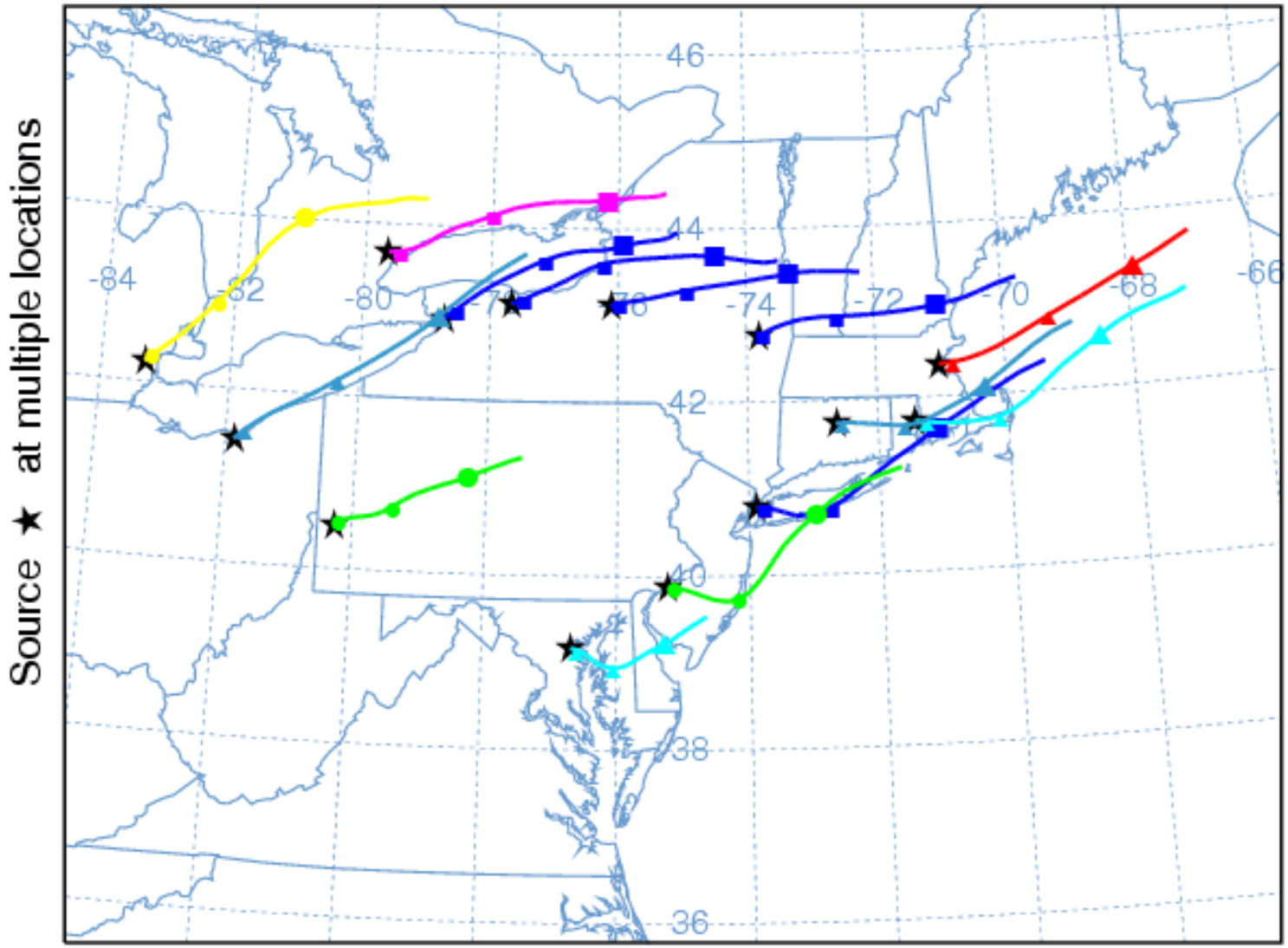
08/02/06 850mb

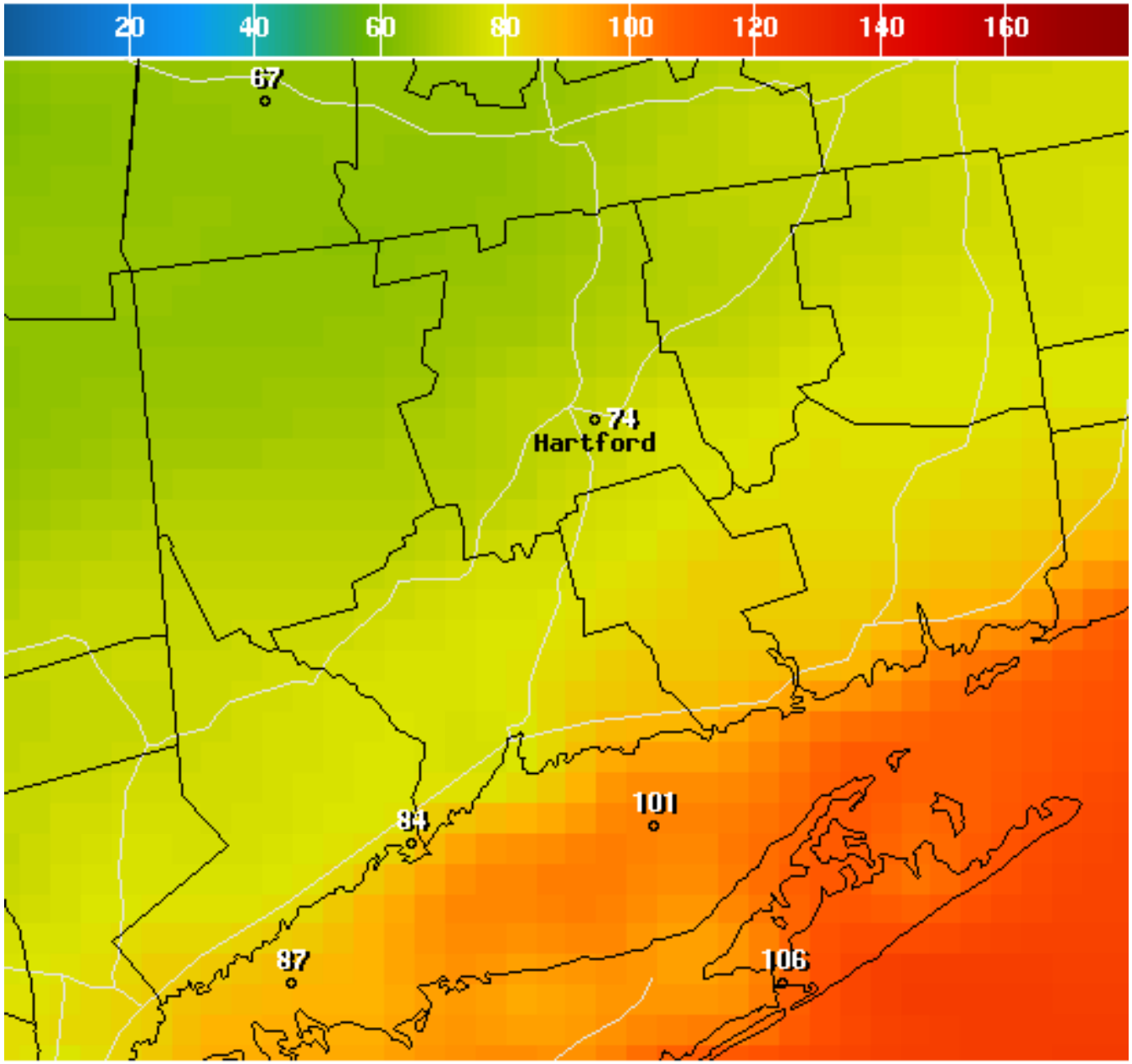


NOAA HYSPLIT MODEL source 10 m AGL

Forward trajectories starting at 11 UTC 02 Aug 06

06 UTC 02 Aug NAM Forecast Initialization





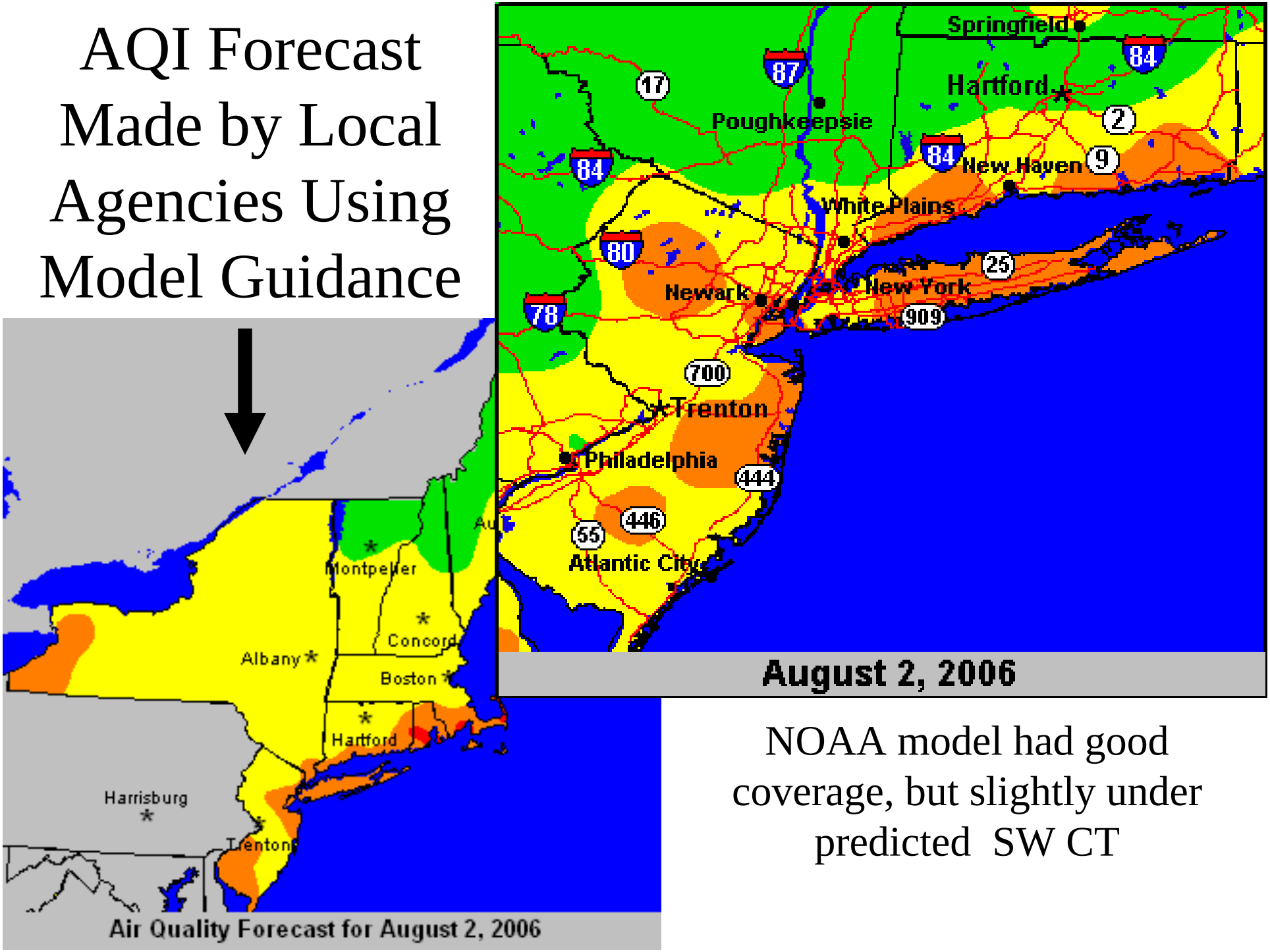
8Hr Avg Ozone Concentration(PPB) Ending Wed Aug 02 2006 8PM EDT

(Thu Aug 03 2006 00Z)

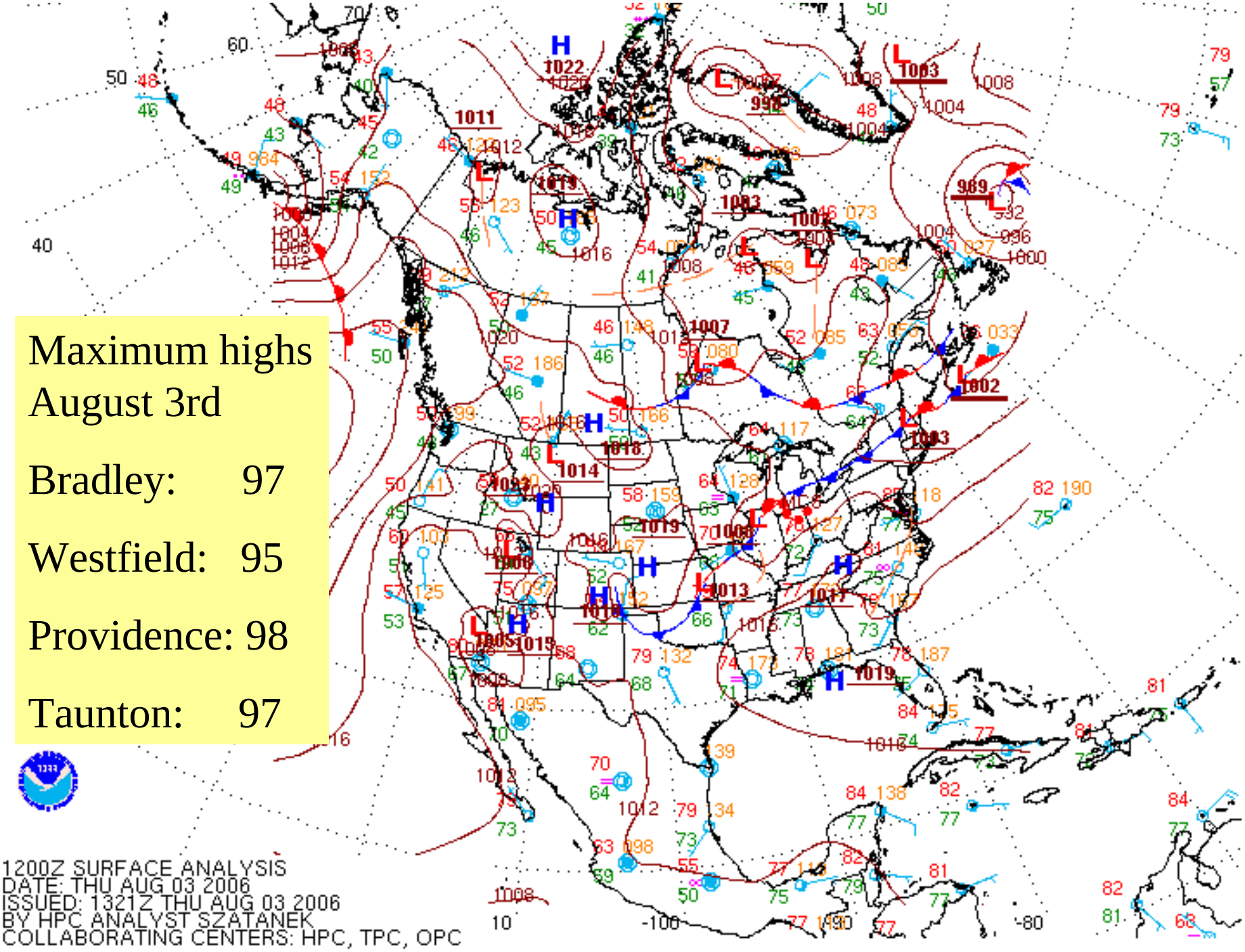
National Digital Guidance Database

06z model run Graphic created-Aug 02 7:27AM EDT

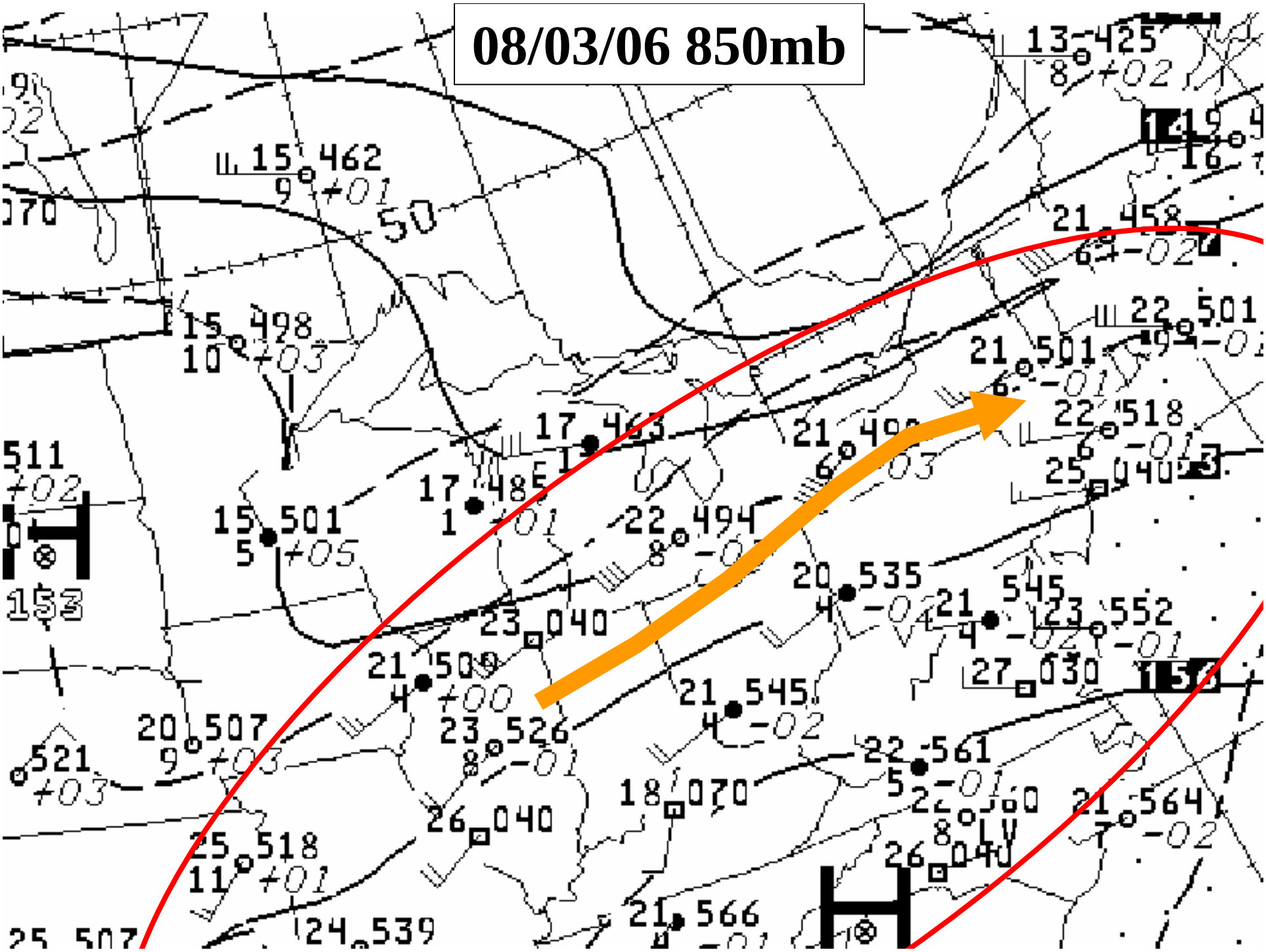
AQI Forecast Made by Local Agencies Using Model Guidance

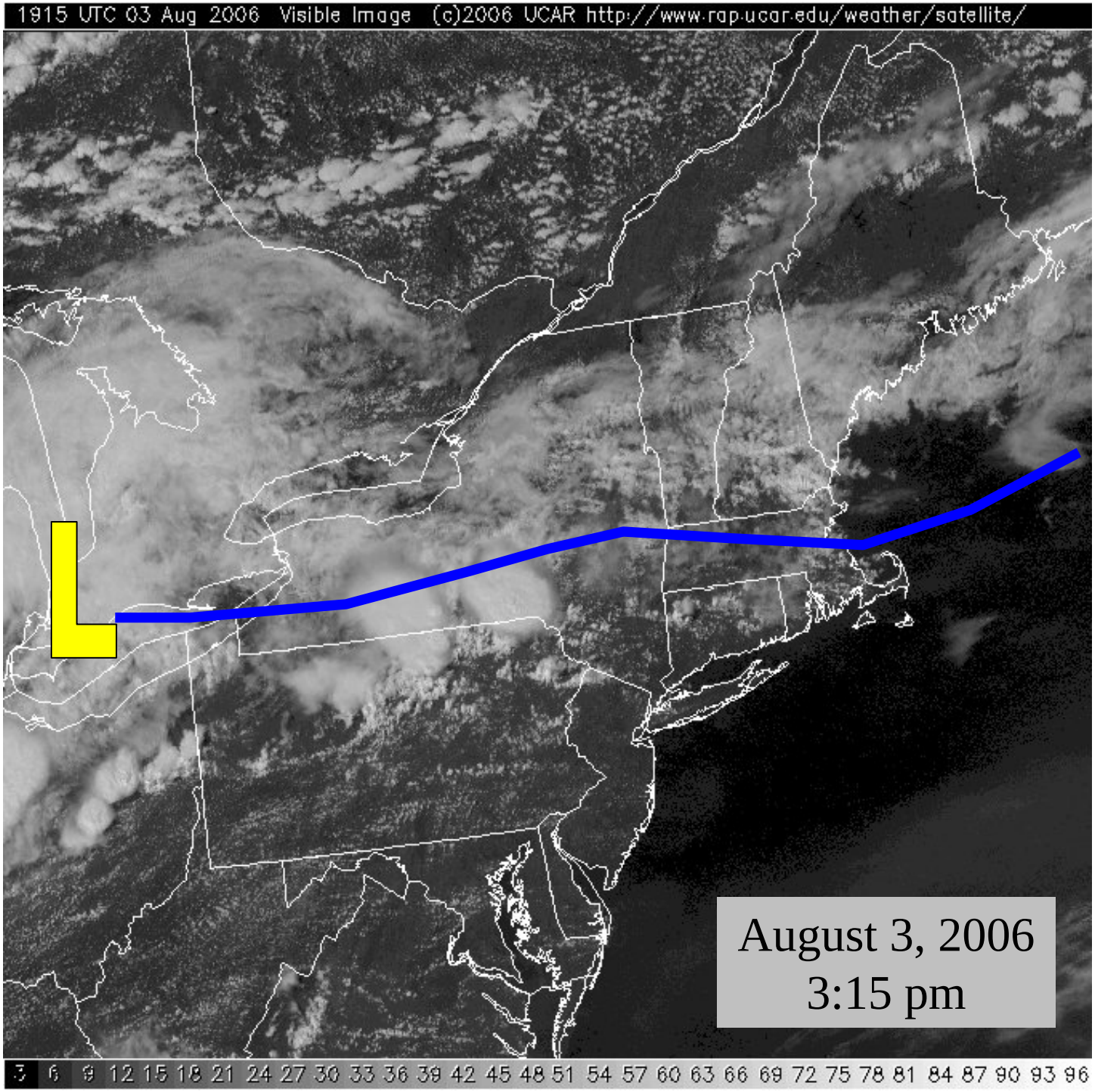


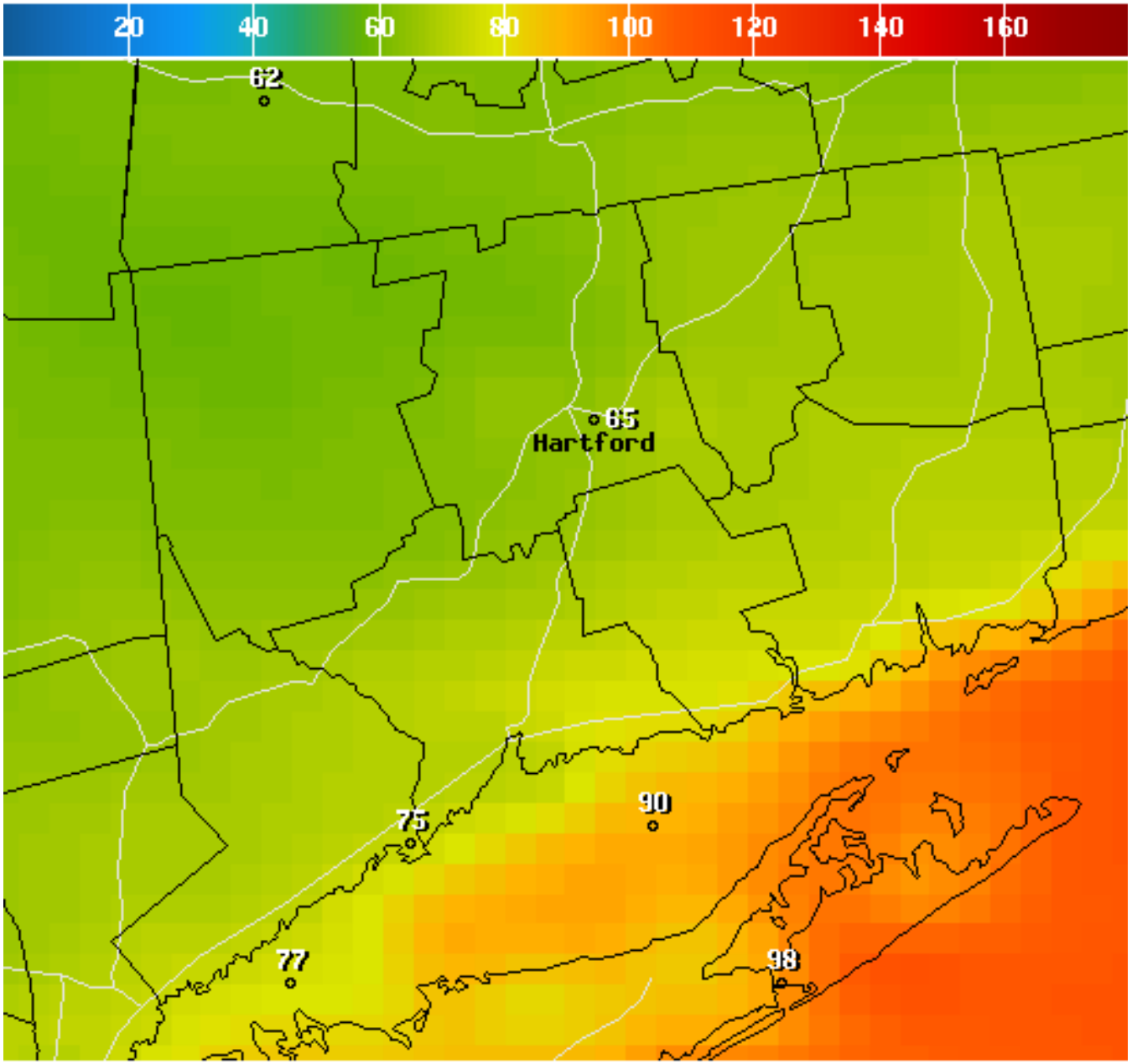
NOAA model had good coverage, but slightly under predicted SW CT


Maximum highs
August 3rd
Bradley: 97
Westfield: 95
Providence: 98
Taunton: 97
1200Z SURFACE ANALYSIS
DATE: THU AUG 03 2006
ISSUED: 1321Z THU AUG 03 2006
BY HPC ANALYST SZATANEK
COLLABORATING CENTERS: HPC, TPC, OPC

08/03/06 850mb




1915 UTC 03 Aug 2006 Visible Image (c)2006 UCAR http://www.rap.ucar.edu/weather/satellite/
L
August 3, 2006
3:15 pm
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78 81 84 87 90 93 96



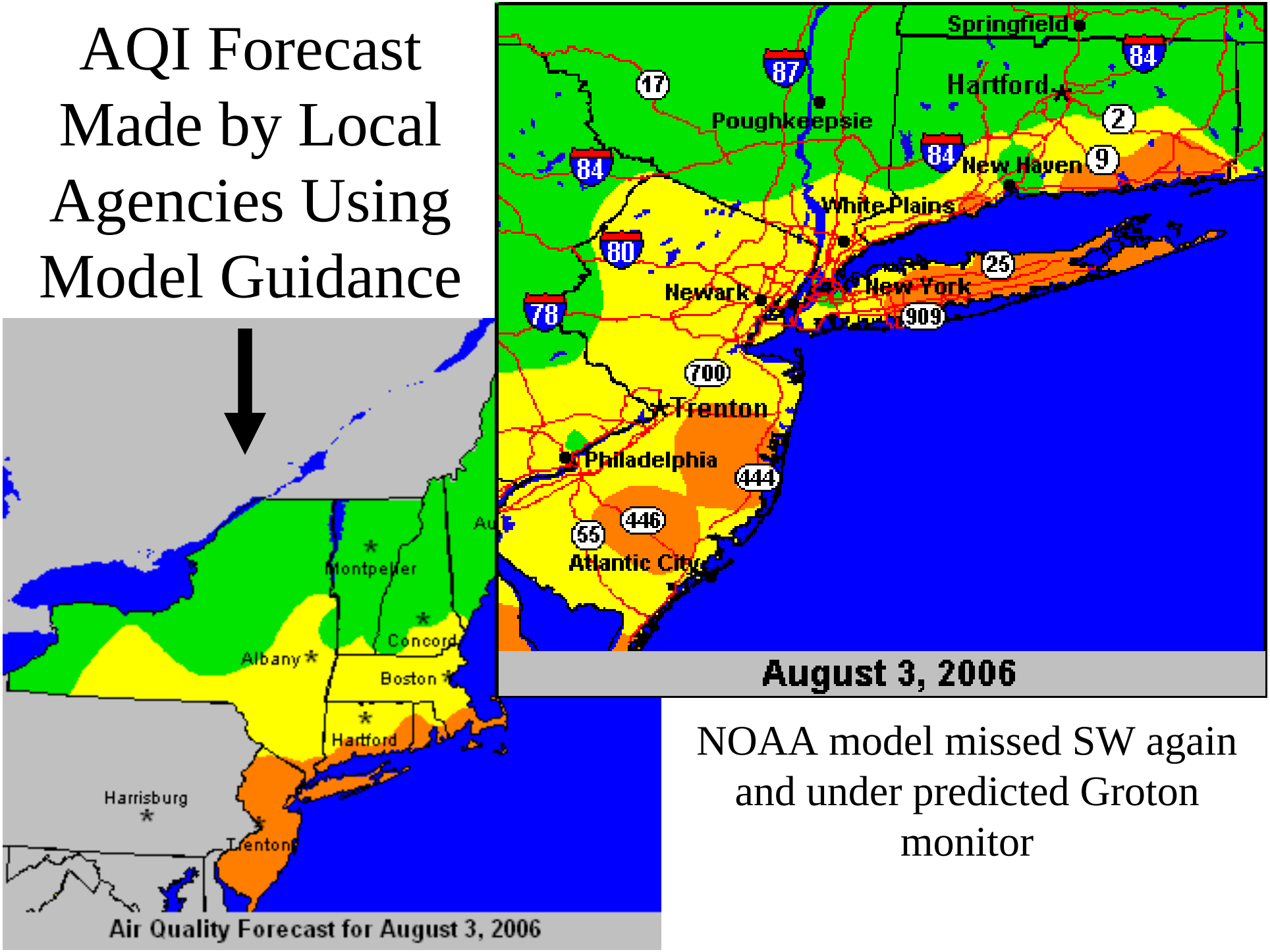
8Hr Avg Ozone Concentration(PPB) Ending Thu Aug 03 2006 7PM EDT

(Thu Aug 03 2006 23Z)

National Digital Guidance Database

06z model run Graphic created-Aug 03 7:28AM EDT

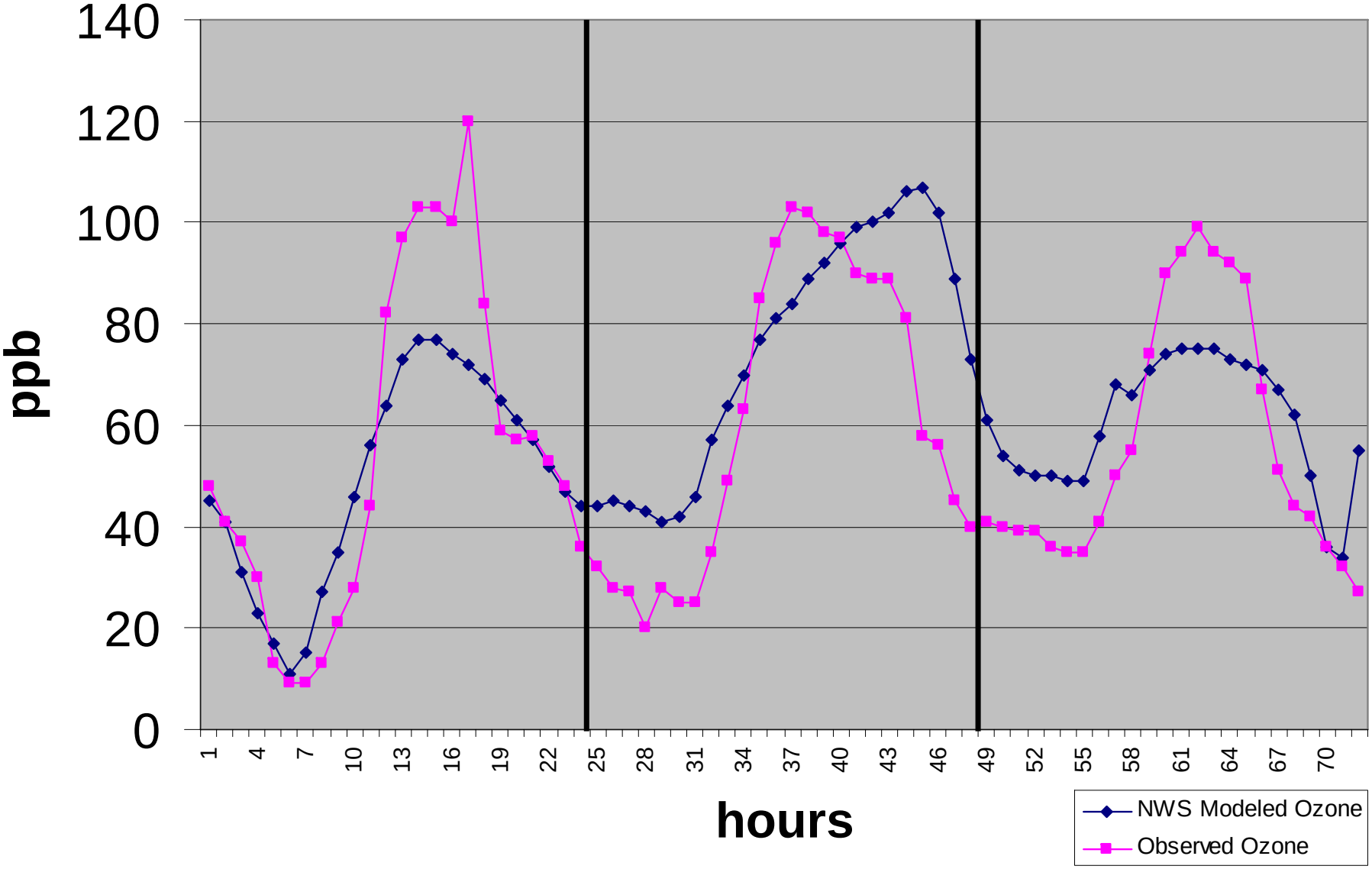
AQI Forecast Made by Local Agencies Using Model Guidance



NOAA model missed SW again and under predicted Groton monitor

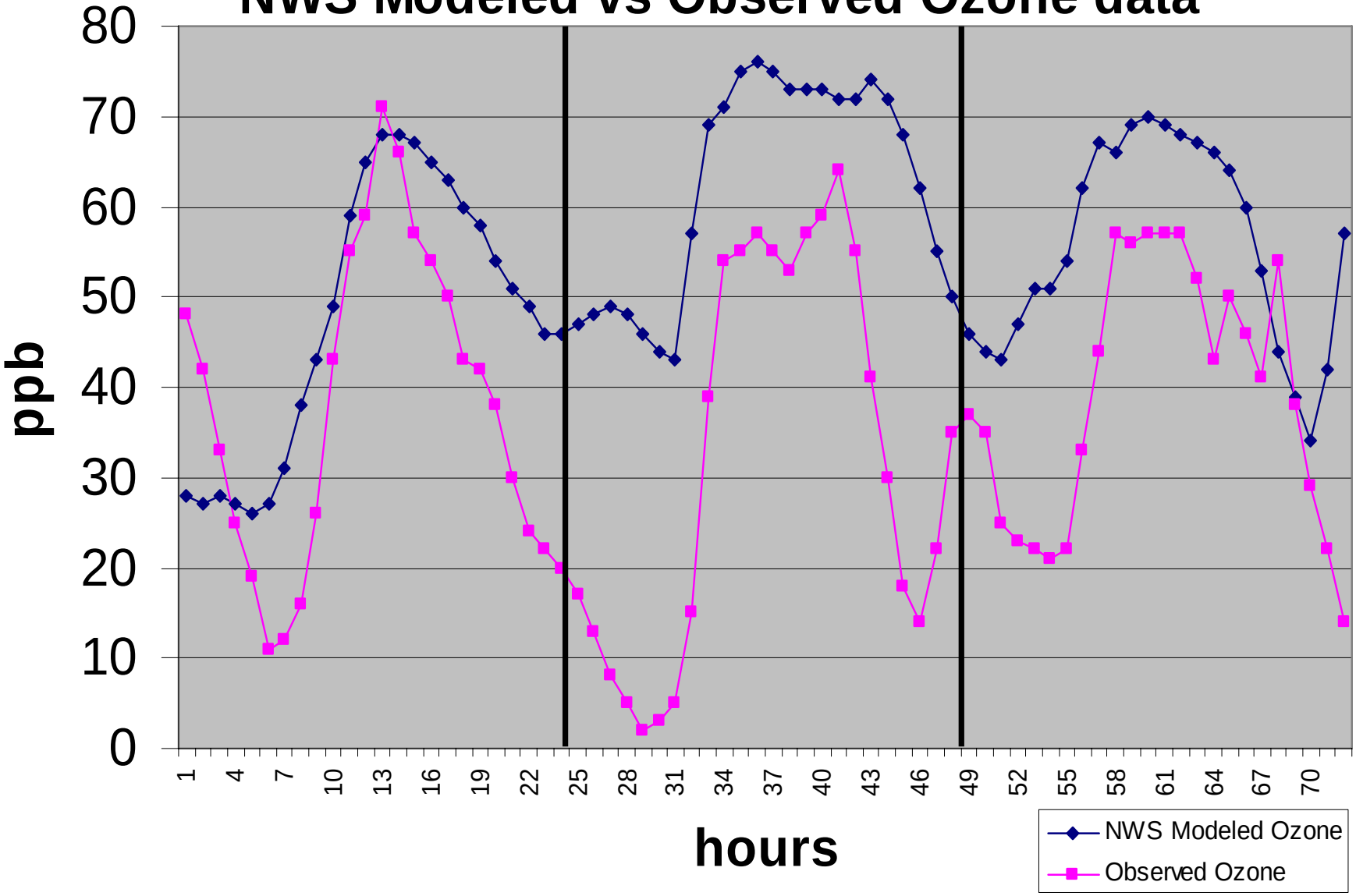
Stratford CT August 1-3, 2006

NWS Modeled vs Observed Ozone Data



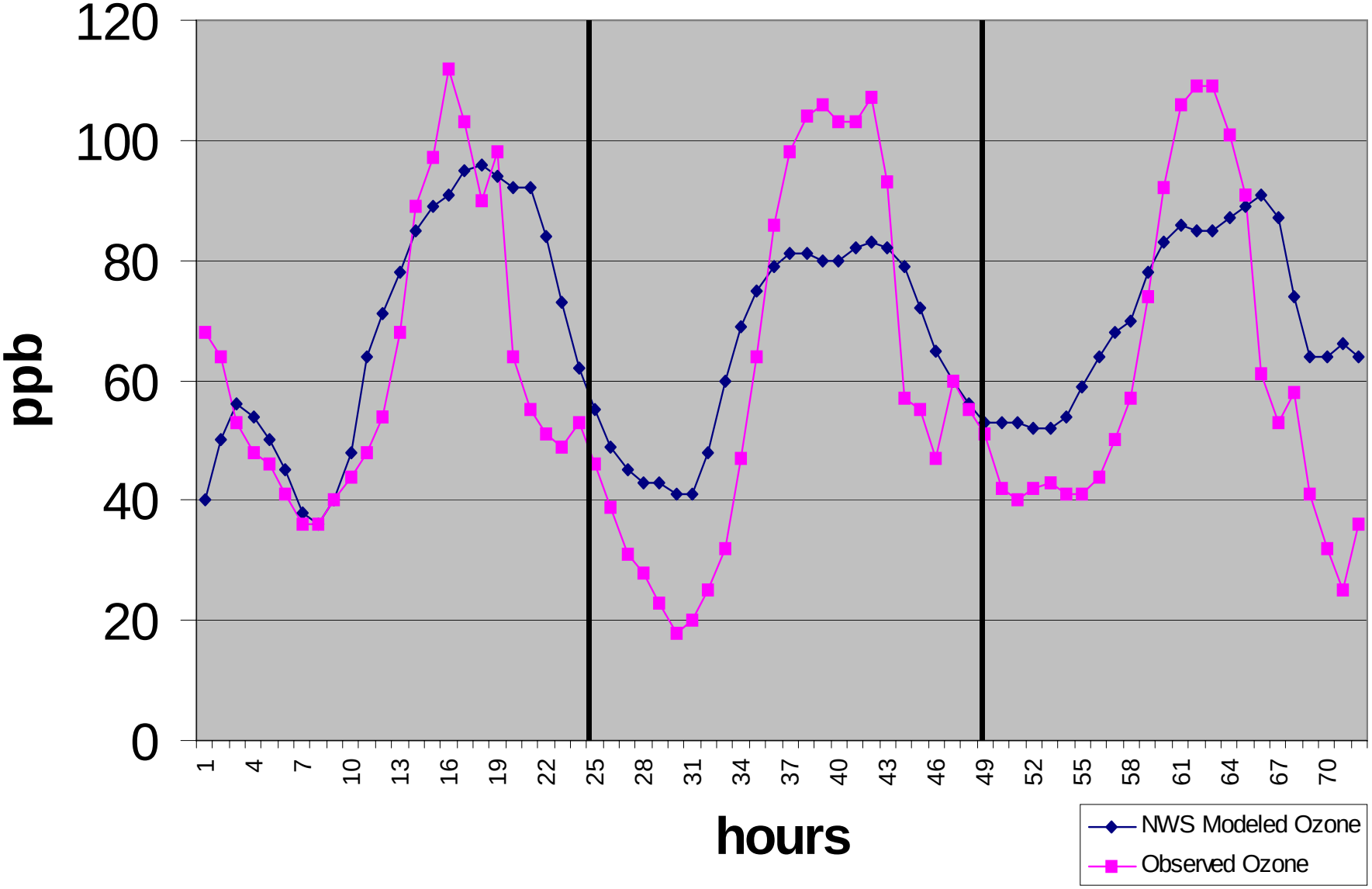
Hartford, CT August 1-3, 2006

NWS Modeled vs Observed Ozone data

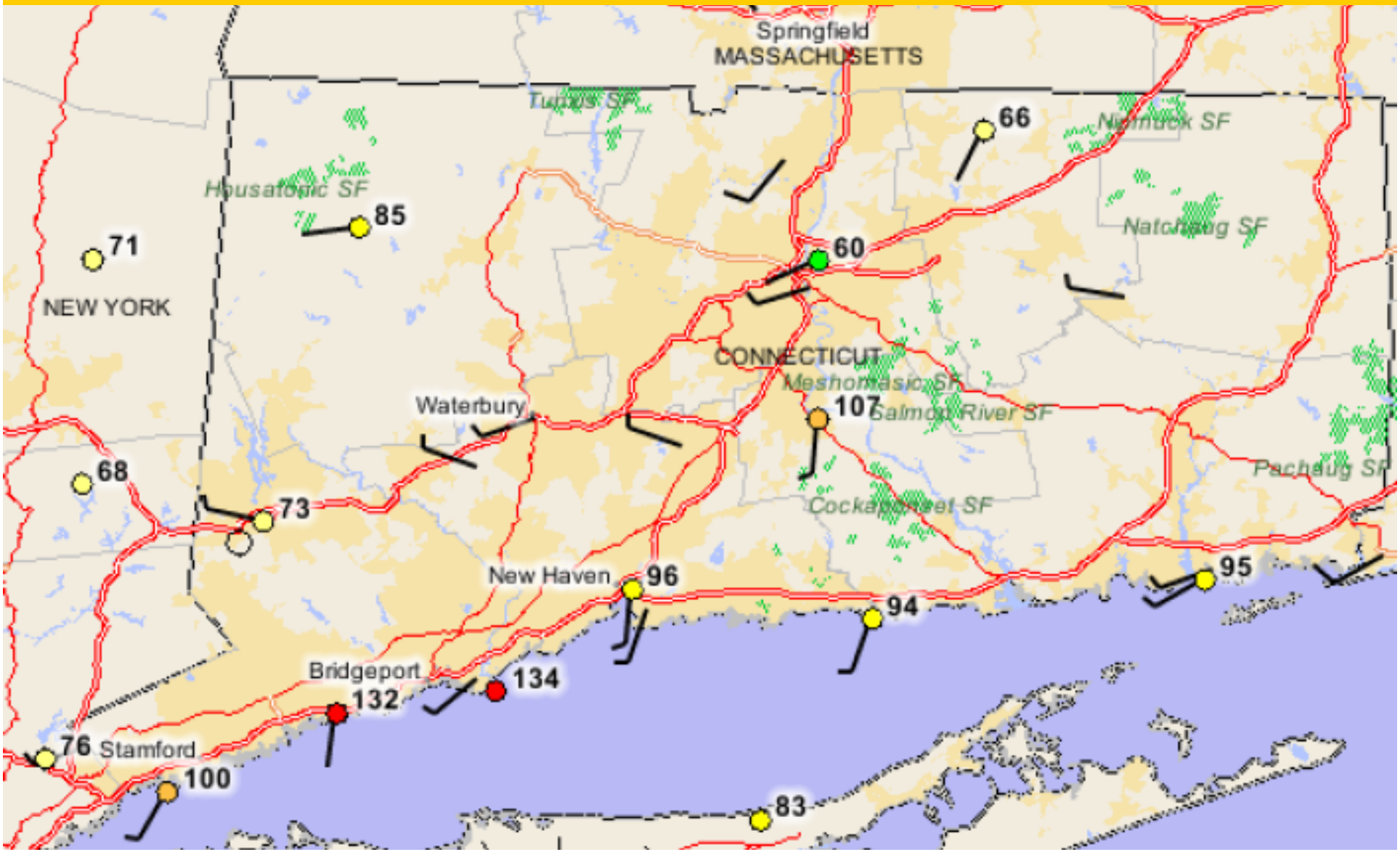


Groton CT, August 1-3, 2006

NWS Modeled vs Observed Ozone Data



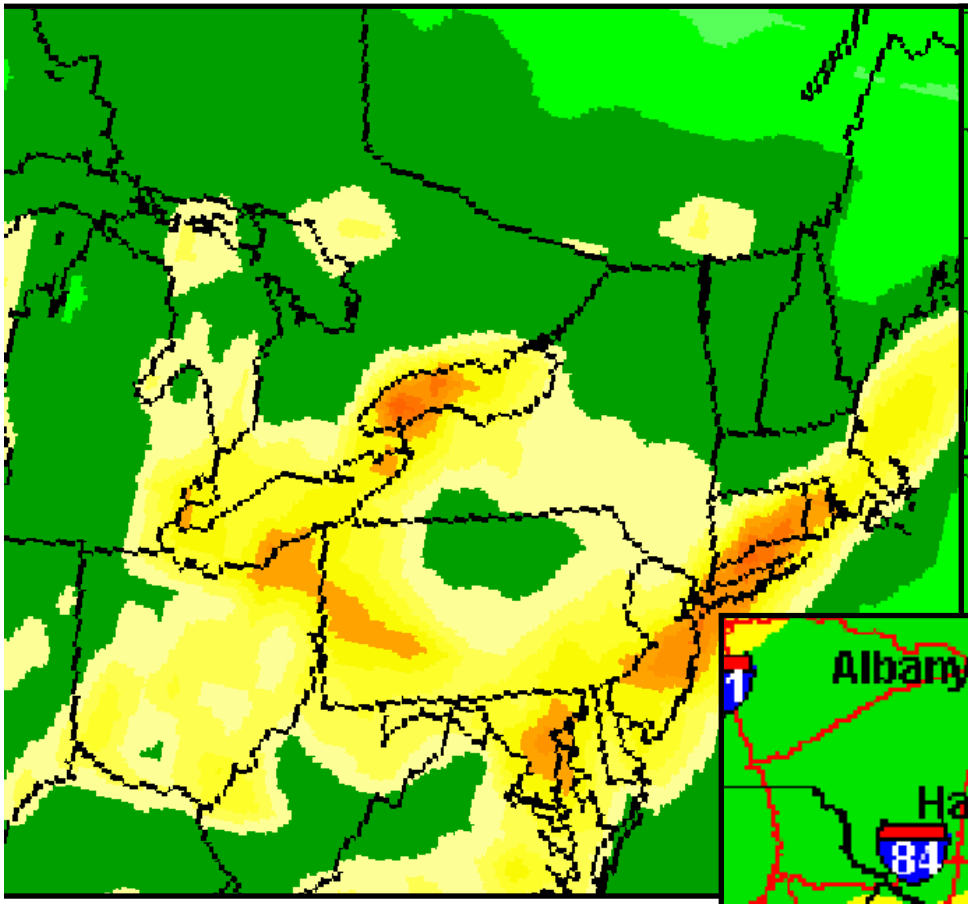
Model Performance for the 13 Ozone Exceedance Days for Connecticut (2006)



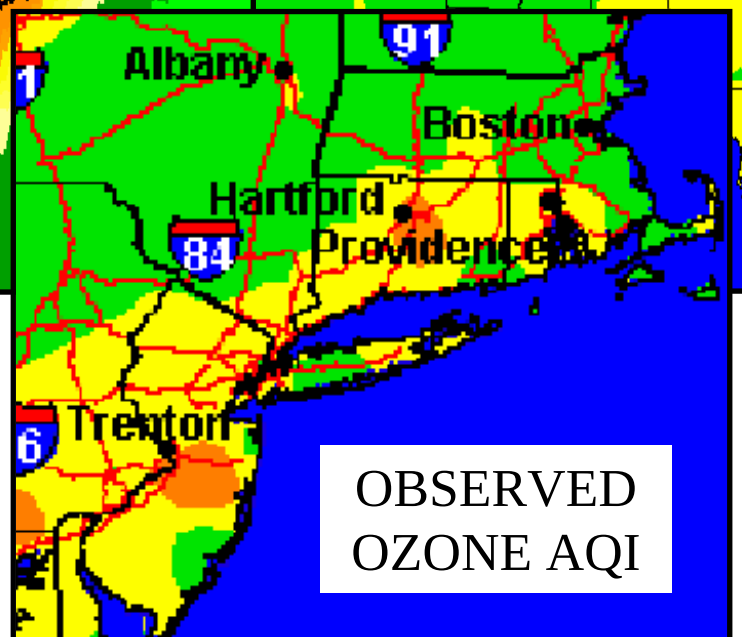
13 Days Ozone Levels USG or Above in CT

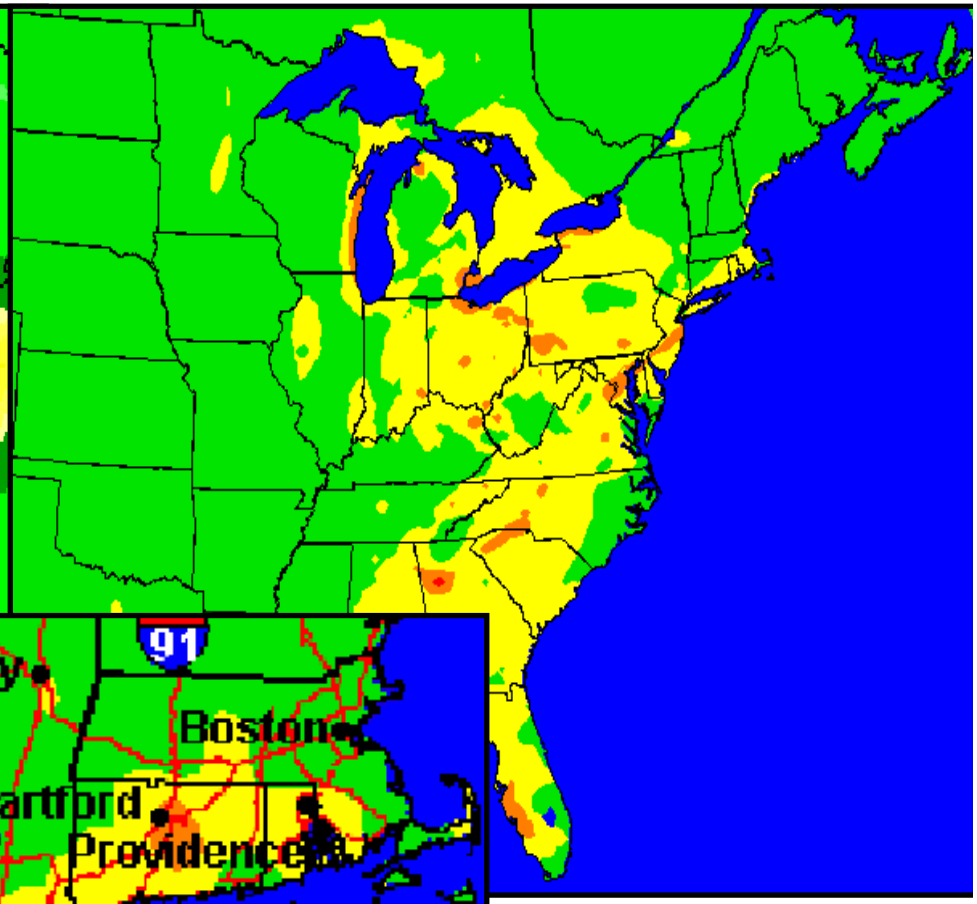
2006	MAQSIP/ NOAA Ozone Model Comparision		
Date	**Obs Maximum AQI**	**MAQSIP Max AQI**	**NOAA Max AQI**
May 29			
June 18			
June 19			
June 22			
July 2			
July 10			
July 17			
July 18			
July 26			
Aug 1			
Aug 2			
Aug 3			
Aug 7			

Model Comparisons- Side by Side



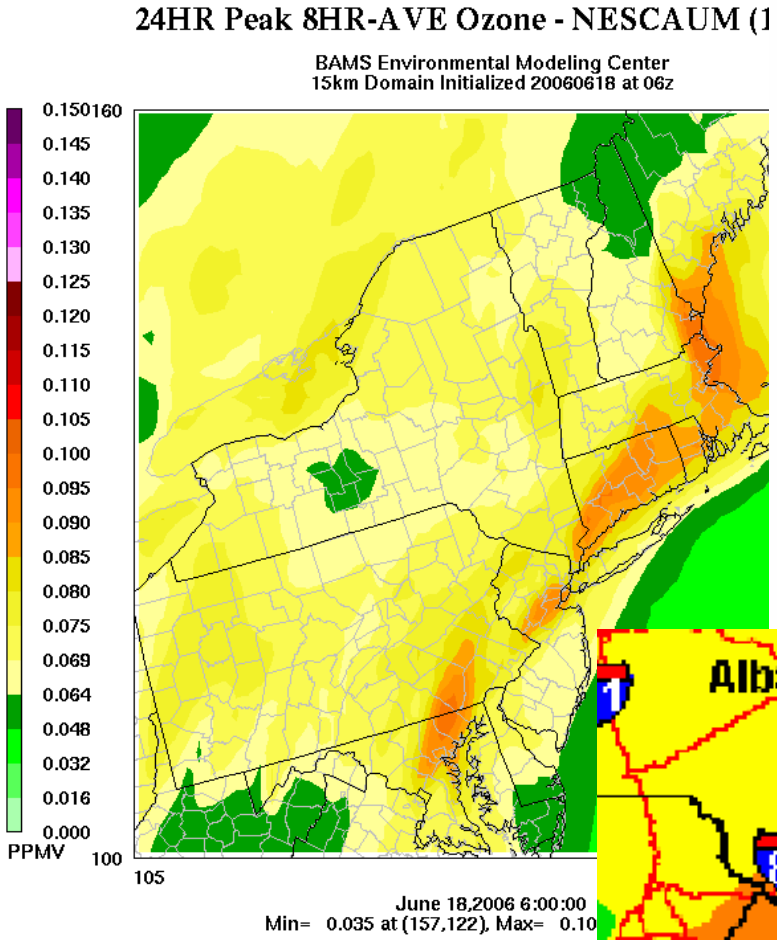
MAQSIP
May 29, 2006



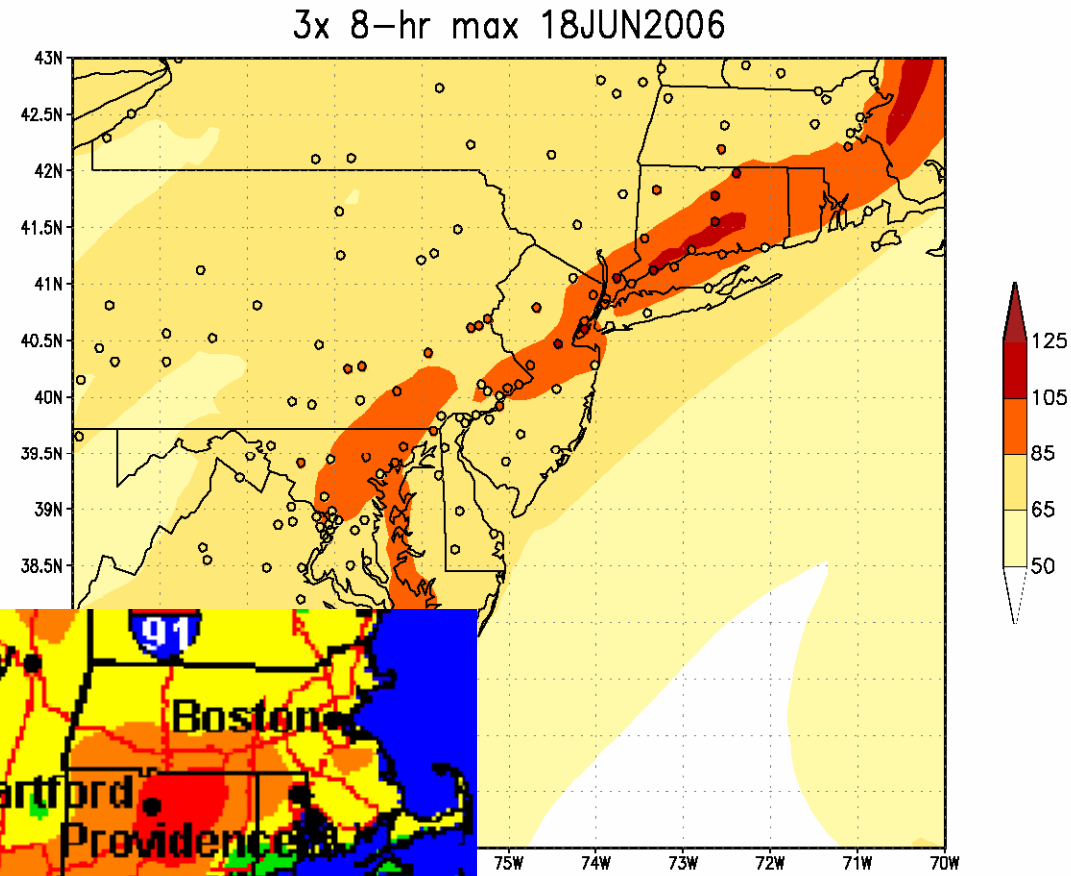


NOAA
May 29, 2006

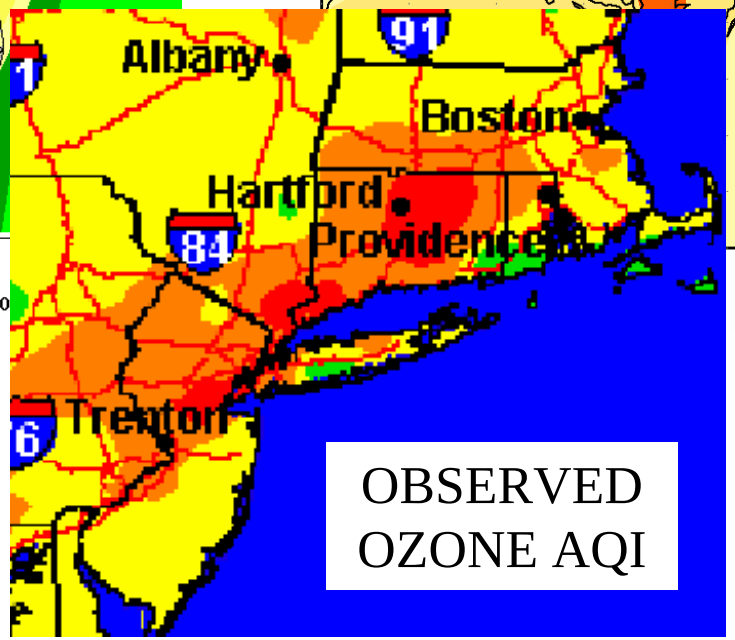
June 18, 2006



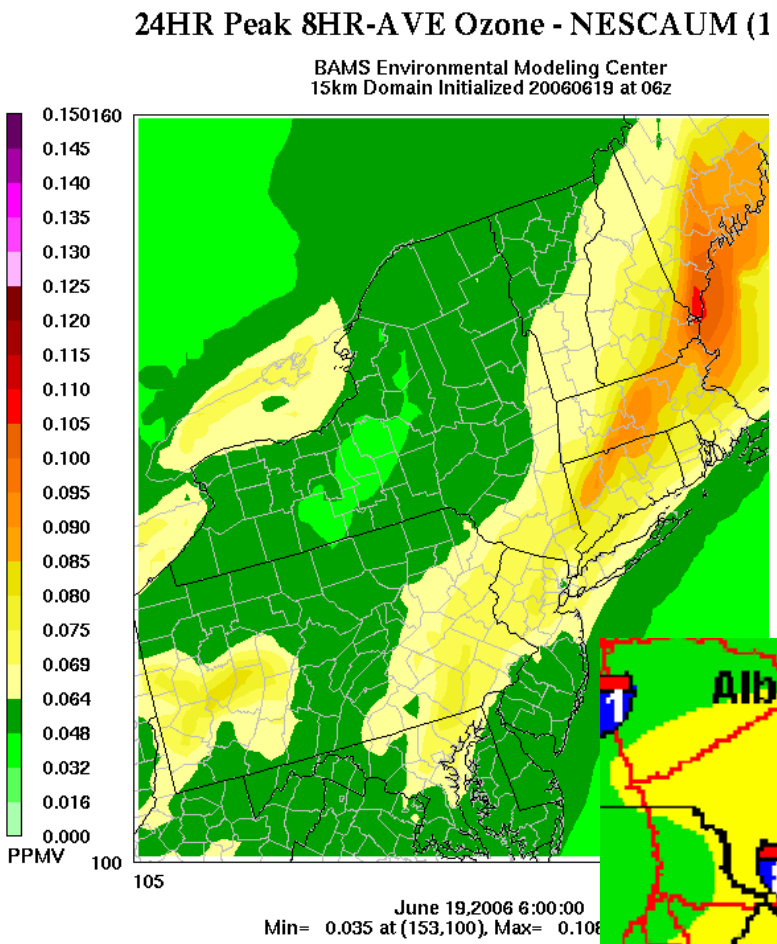
MAQSIP



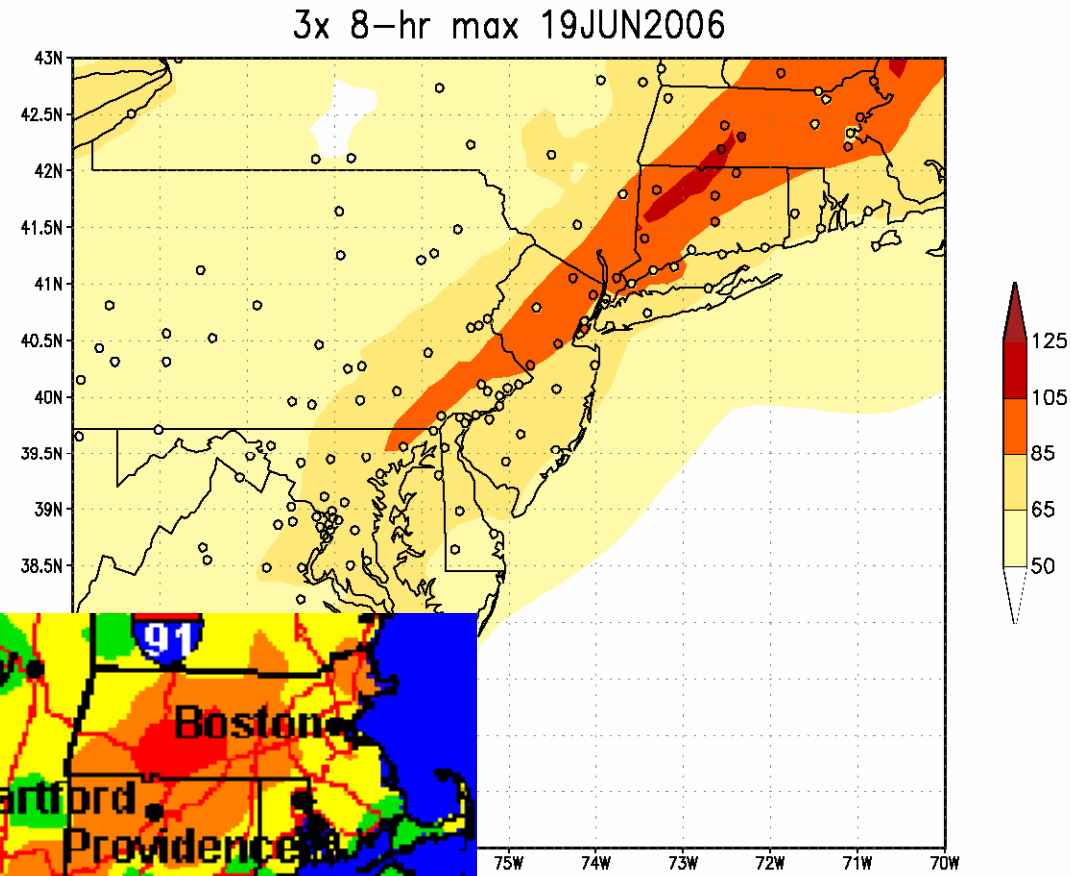
NOAA



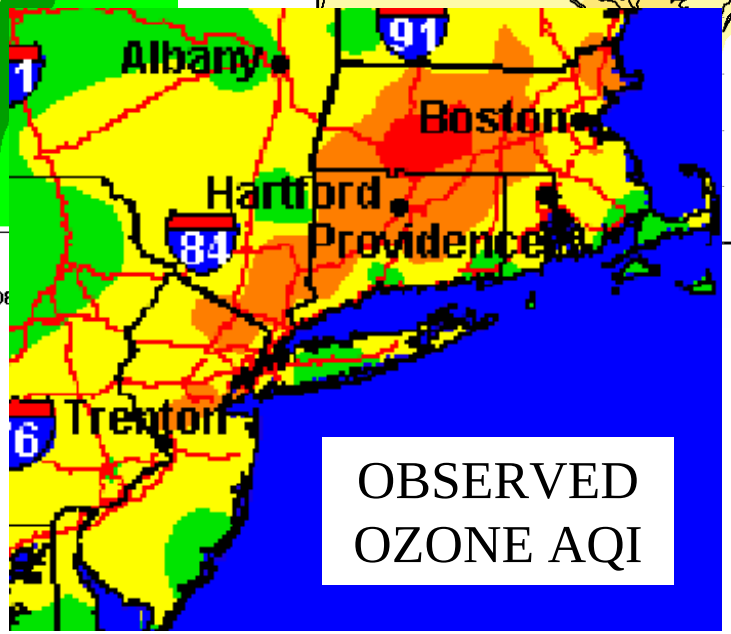
June 19, 2006



MAQSIP

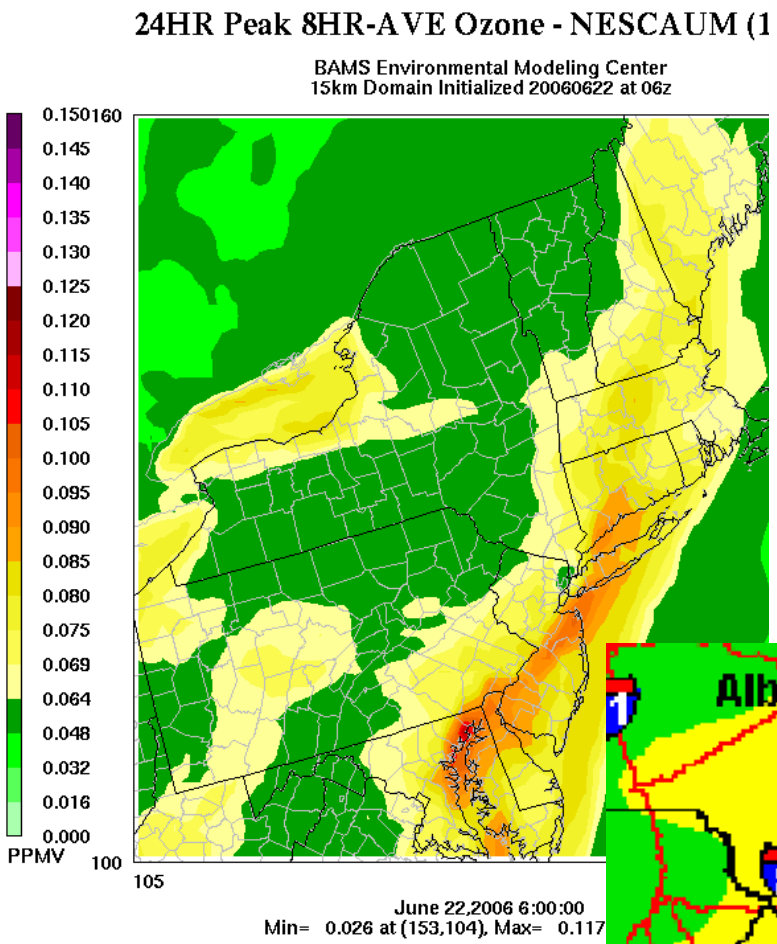


NOAA

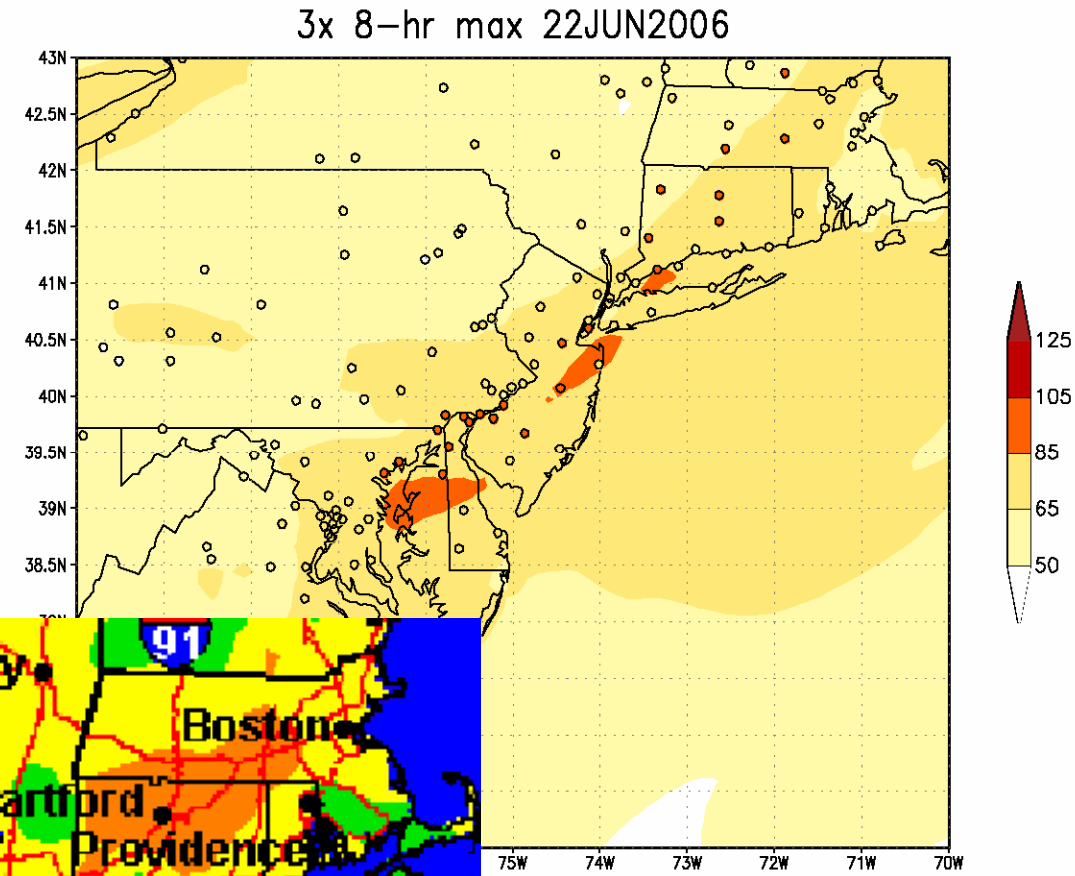


OBSERVED
OZONE AQI

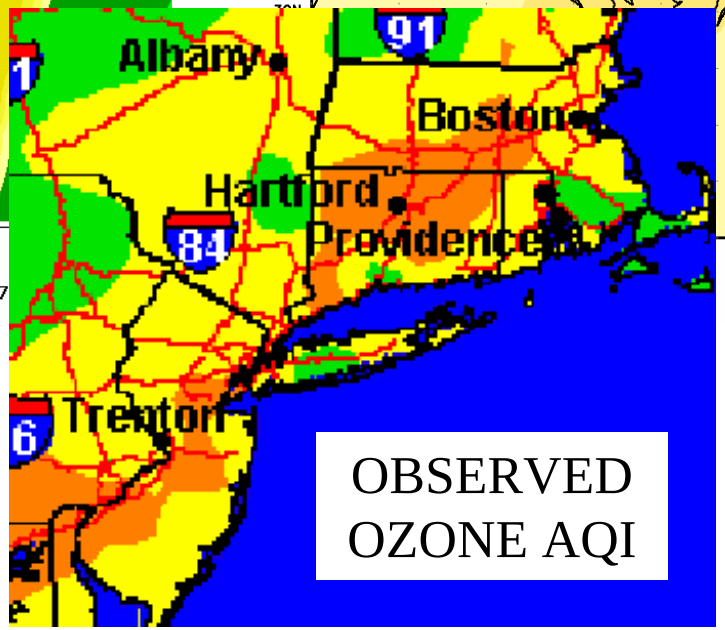
June 22, 2006



MAQSIP

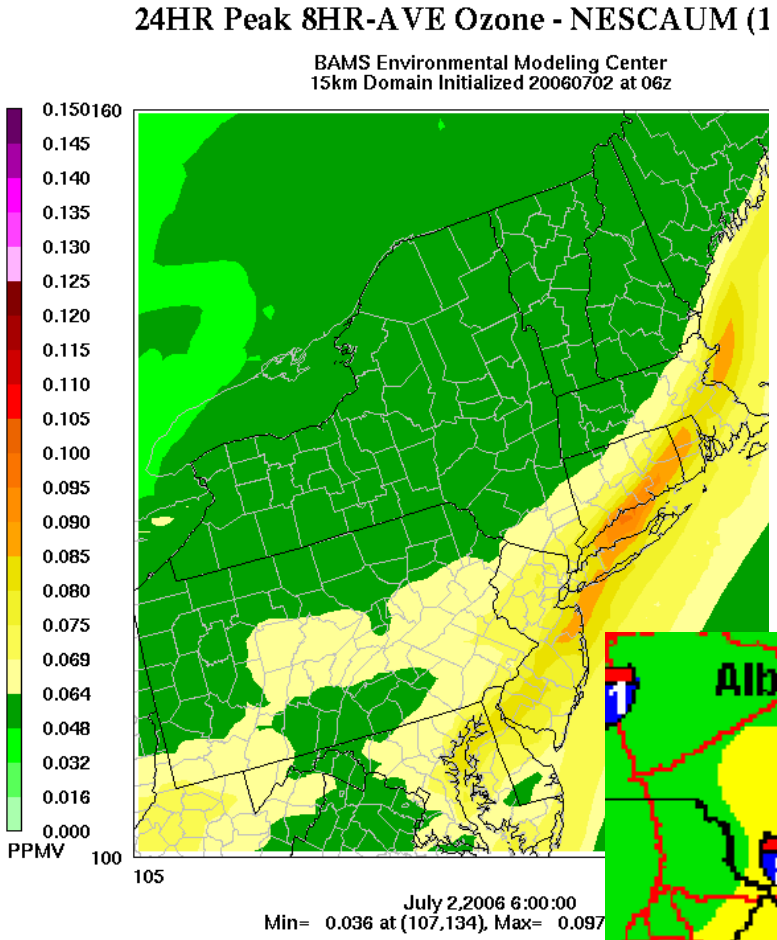


NOAA

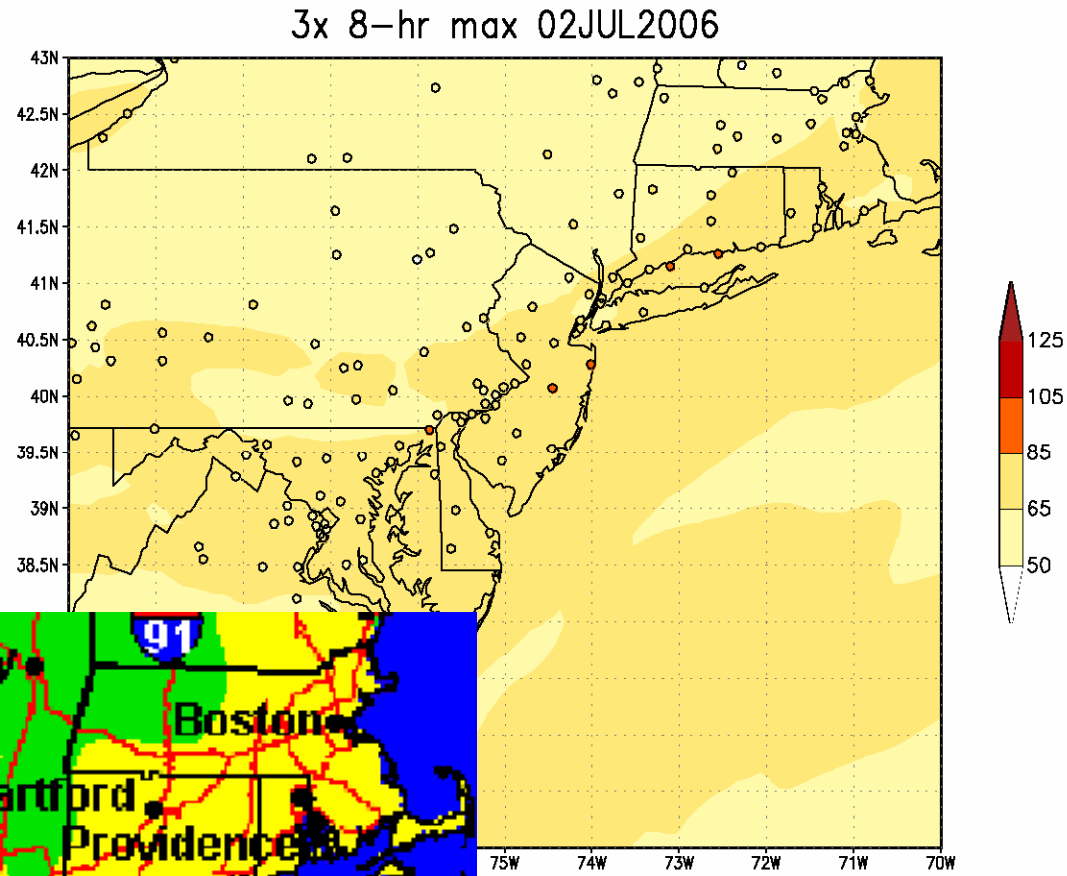


OBSERVED
OZONE AQI

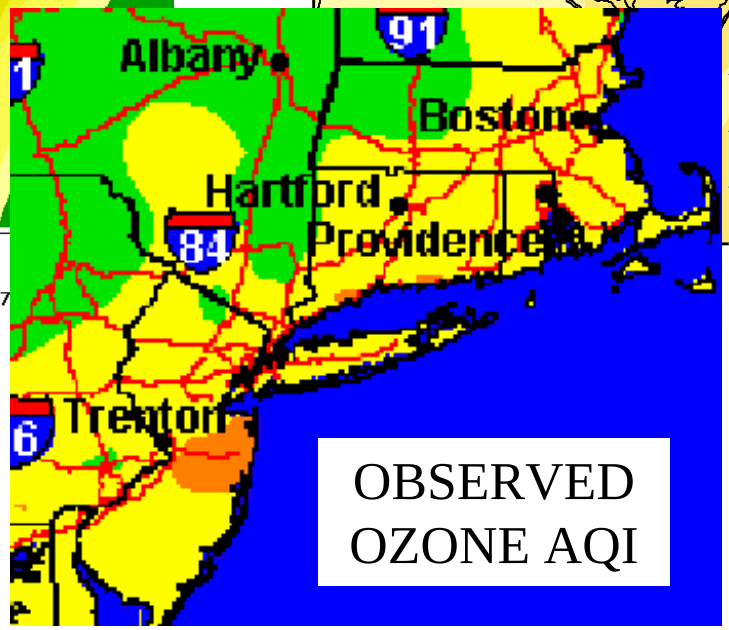
July 02, 2006



MAQSIP

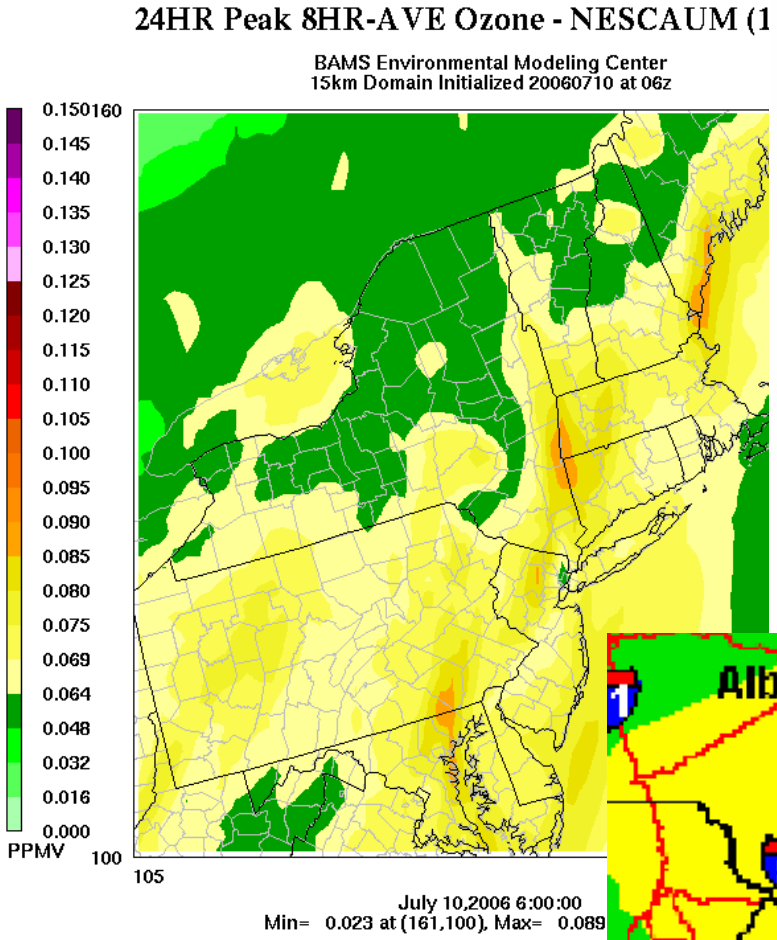


NOAA

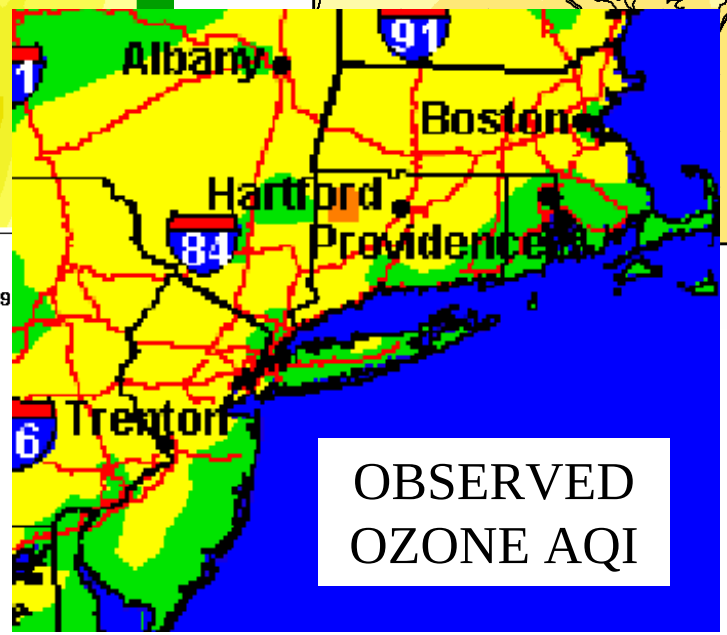


OBSERVED
OZONE AQI

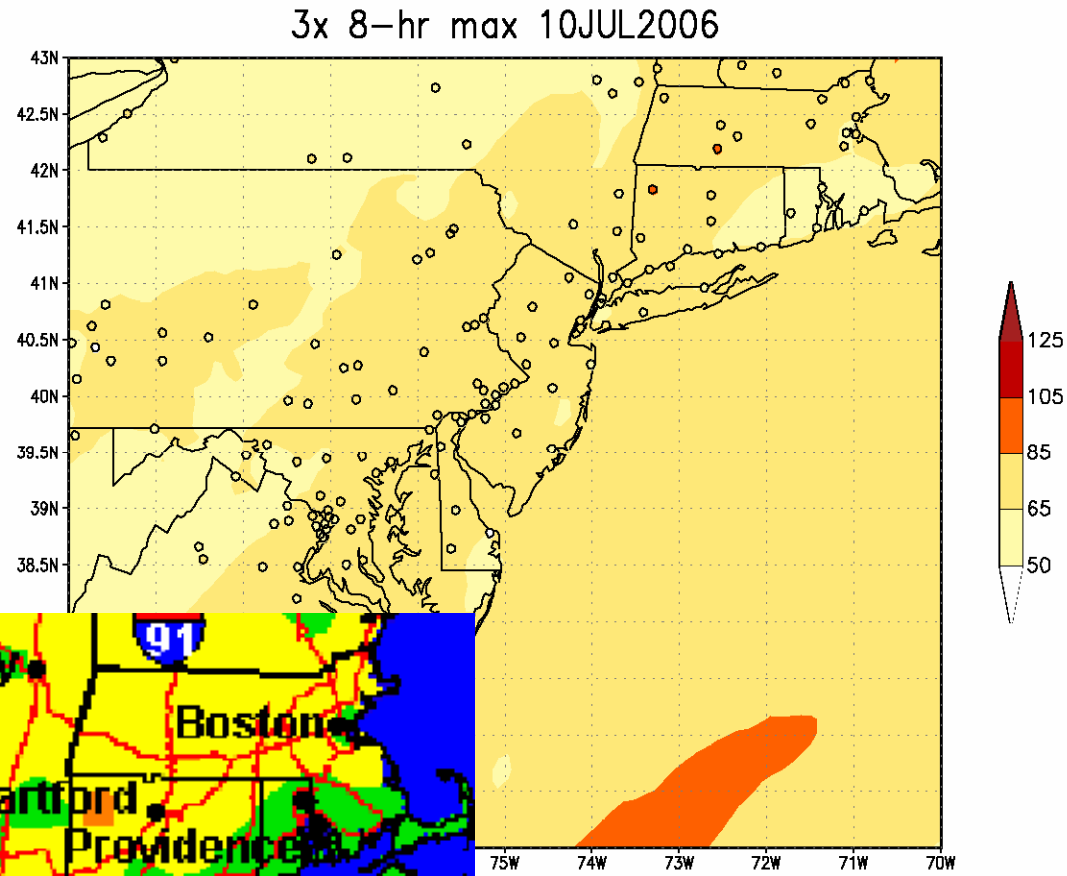
July 10, 2006



MAQSIP

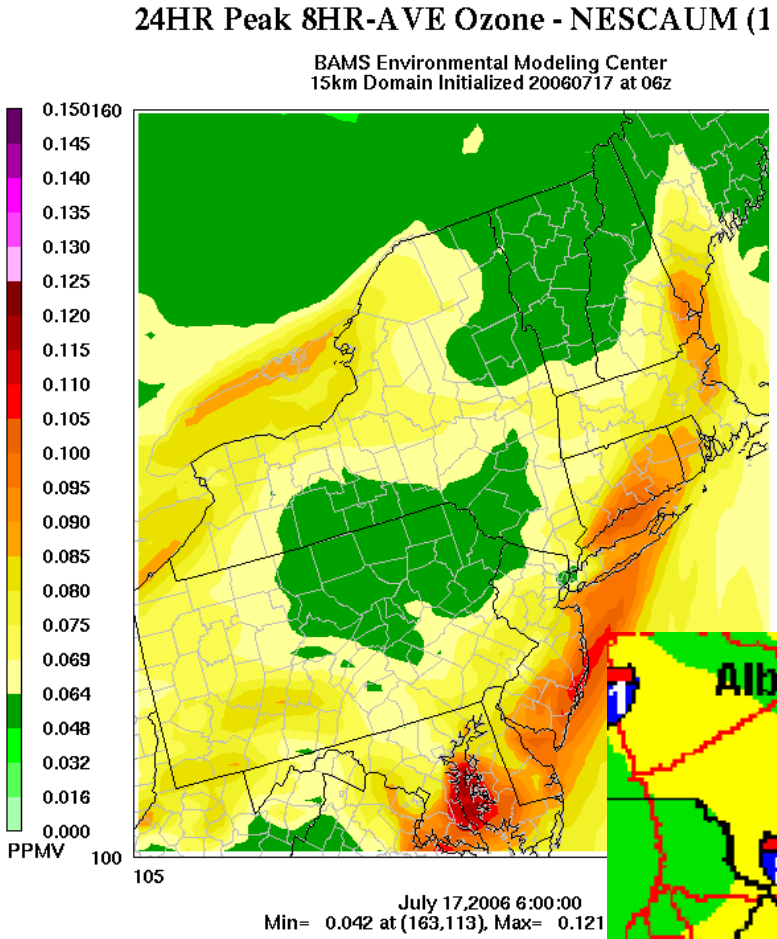


OBSERVED
OZONE AQI

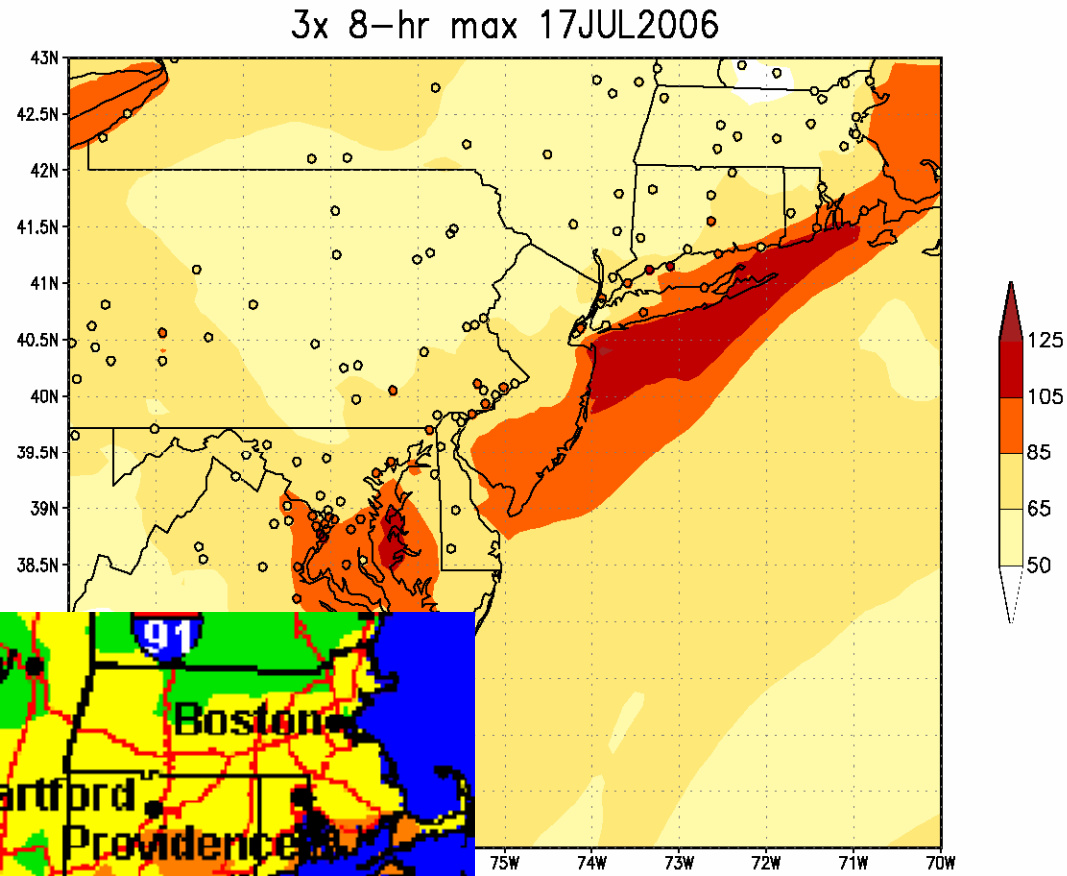


NOAA

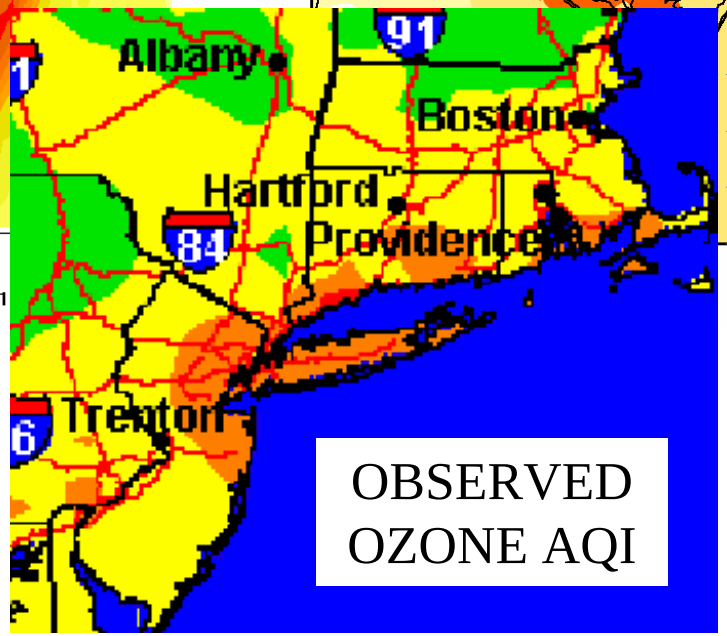
July 17, 2006



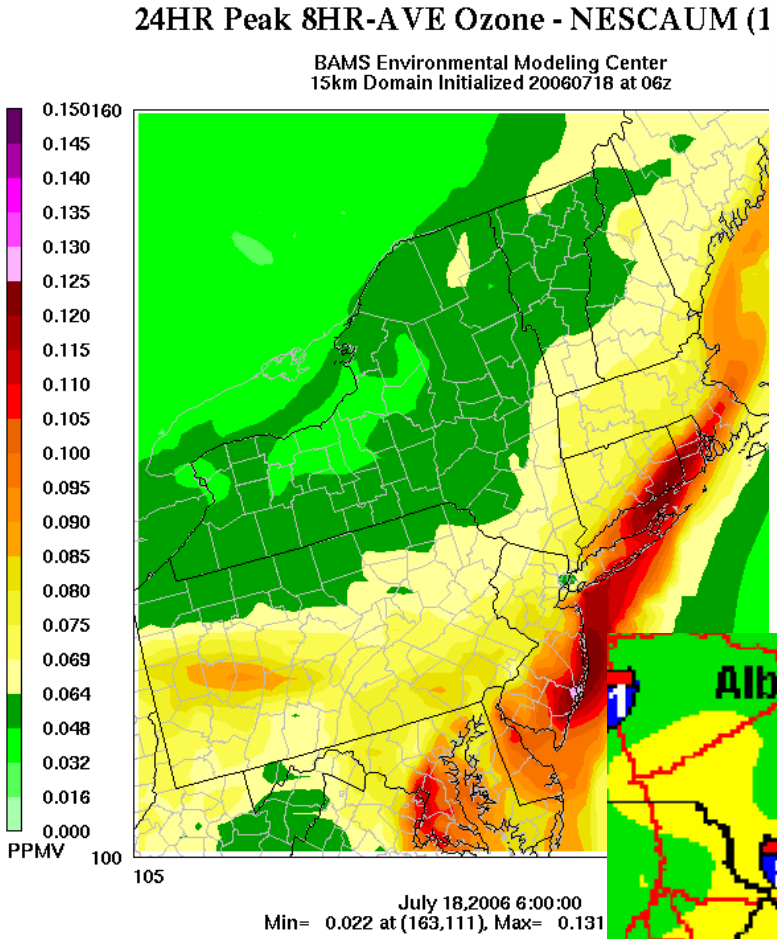
MAQSIP



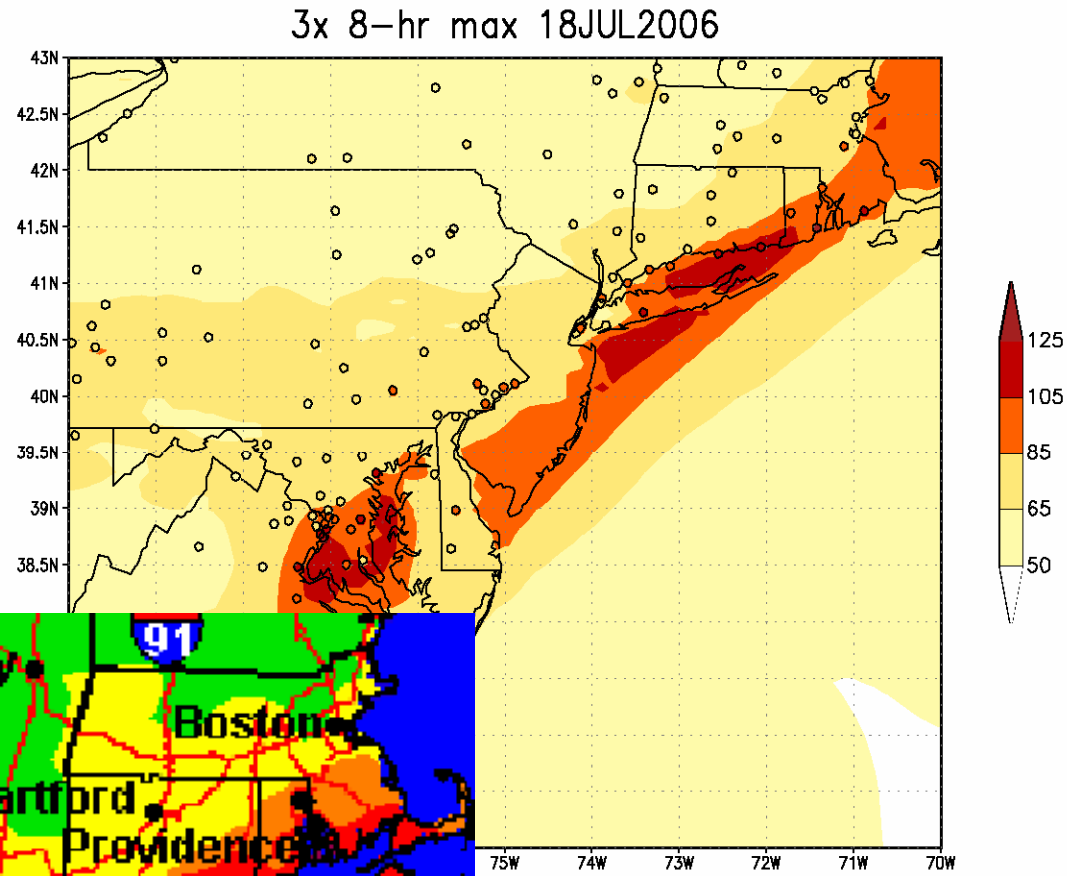
NOAA



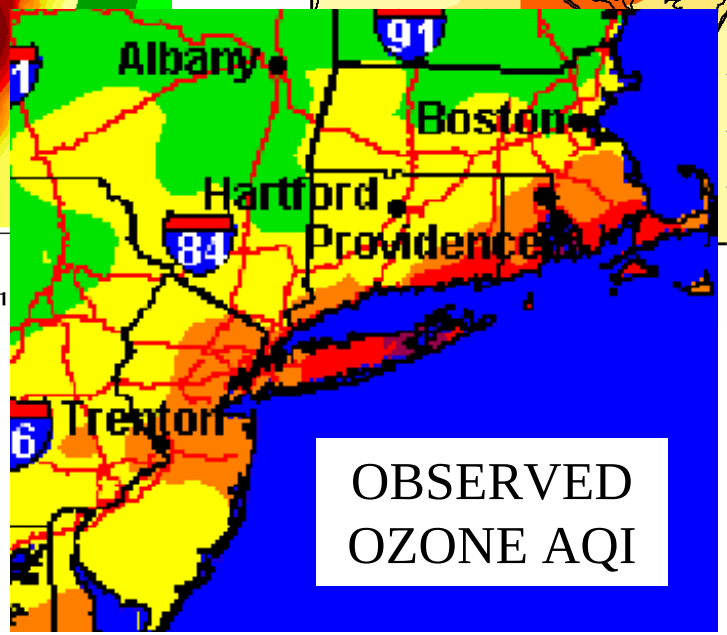
July 18, 2006



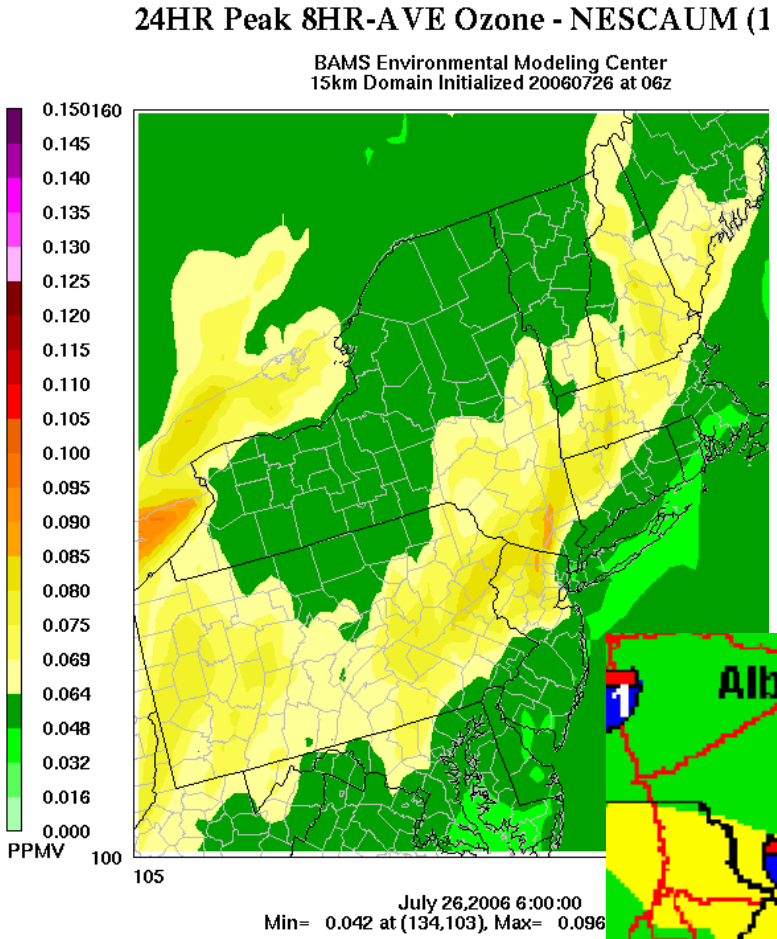
MAQSIP



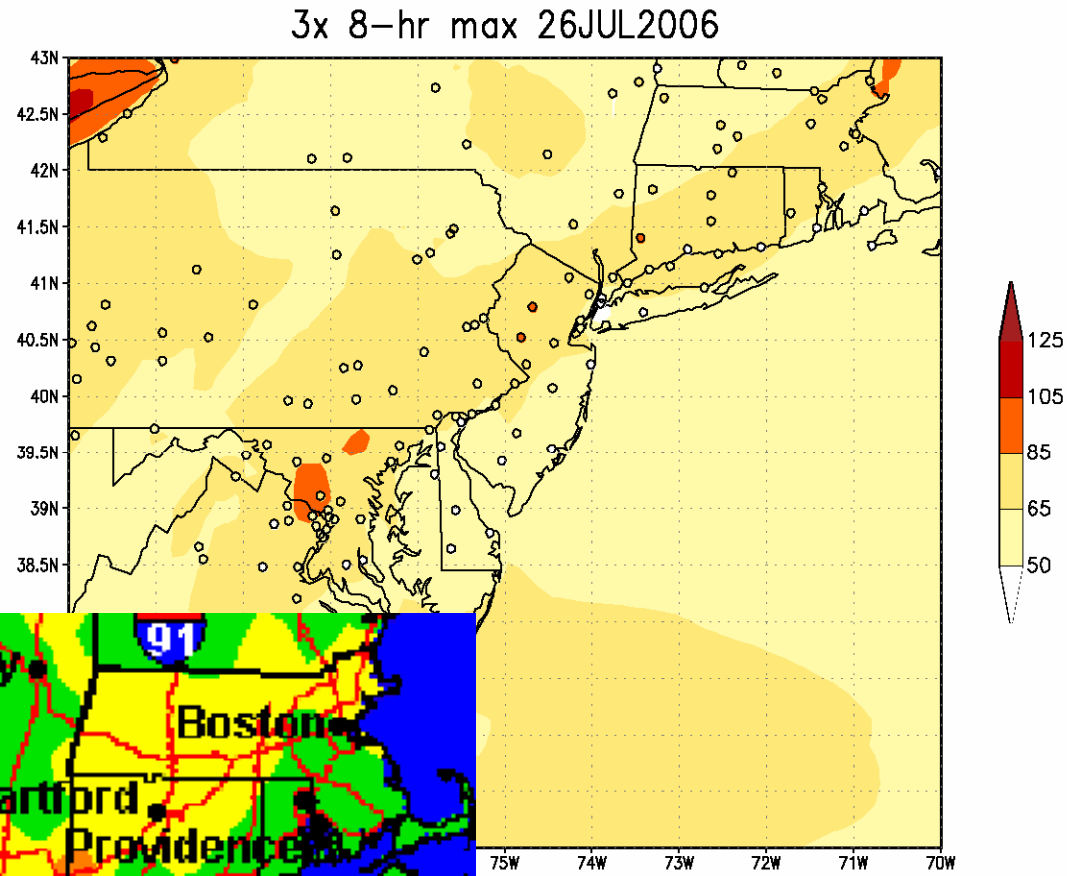
NOAA



July 26, 2006



MAQSIP



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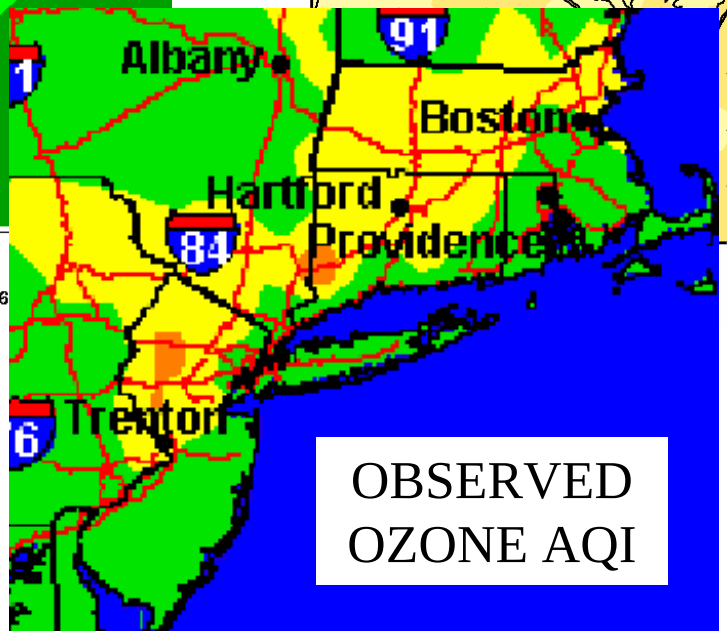
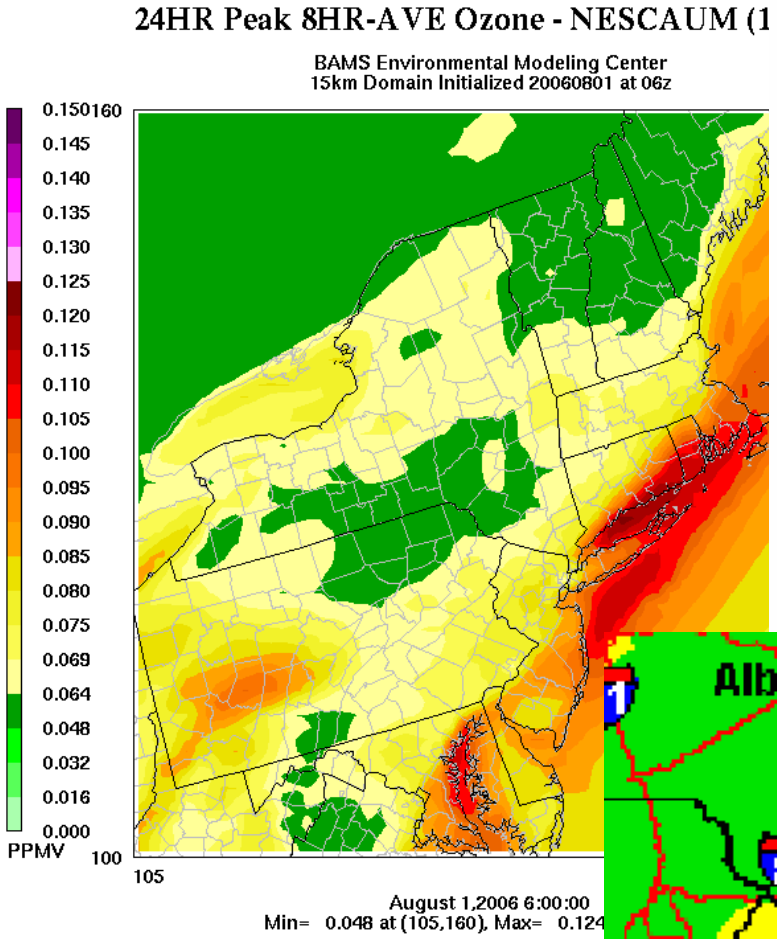


August 01, 2006



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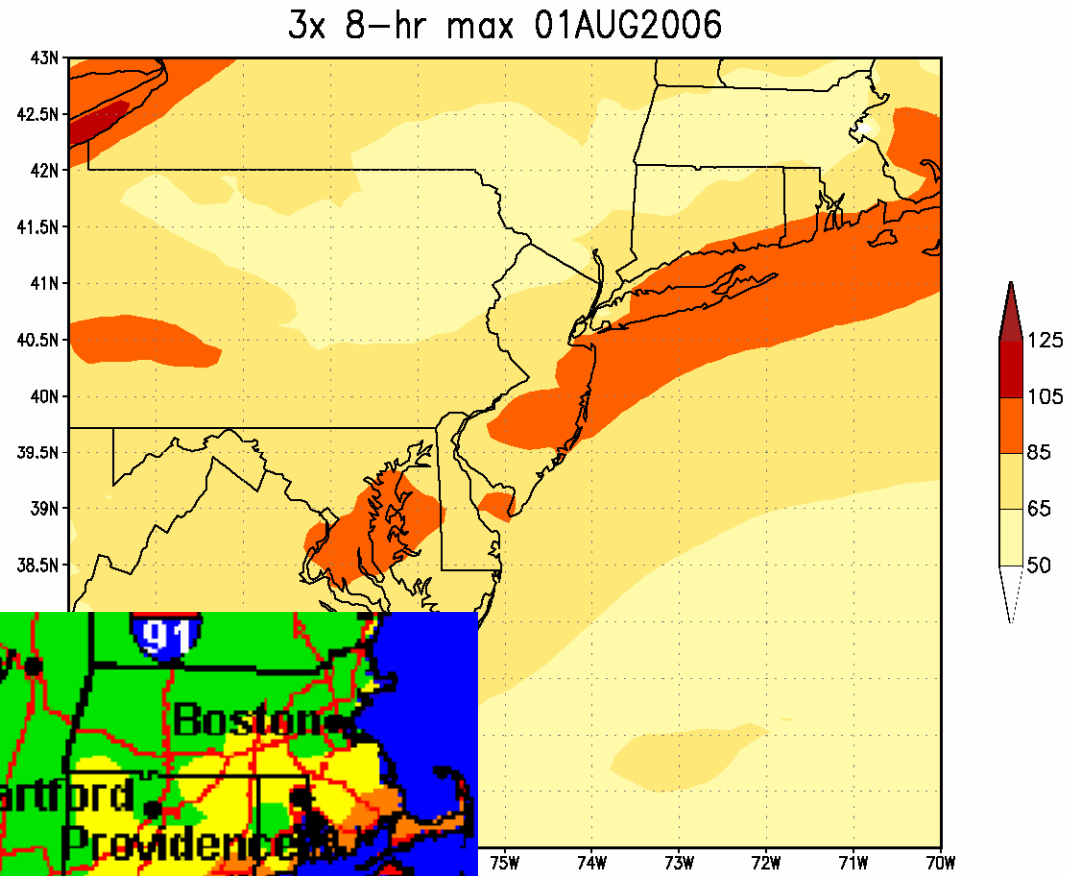

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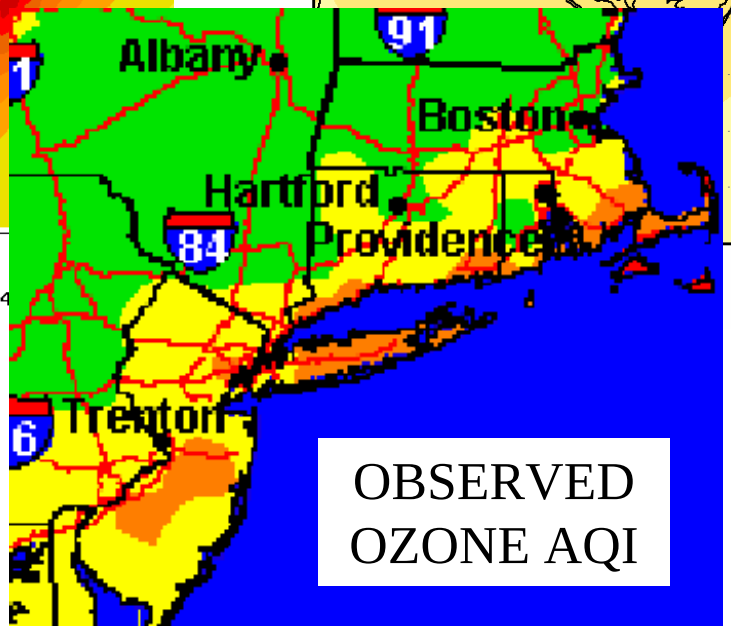
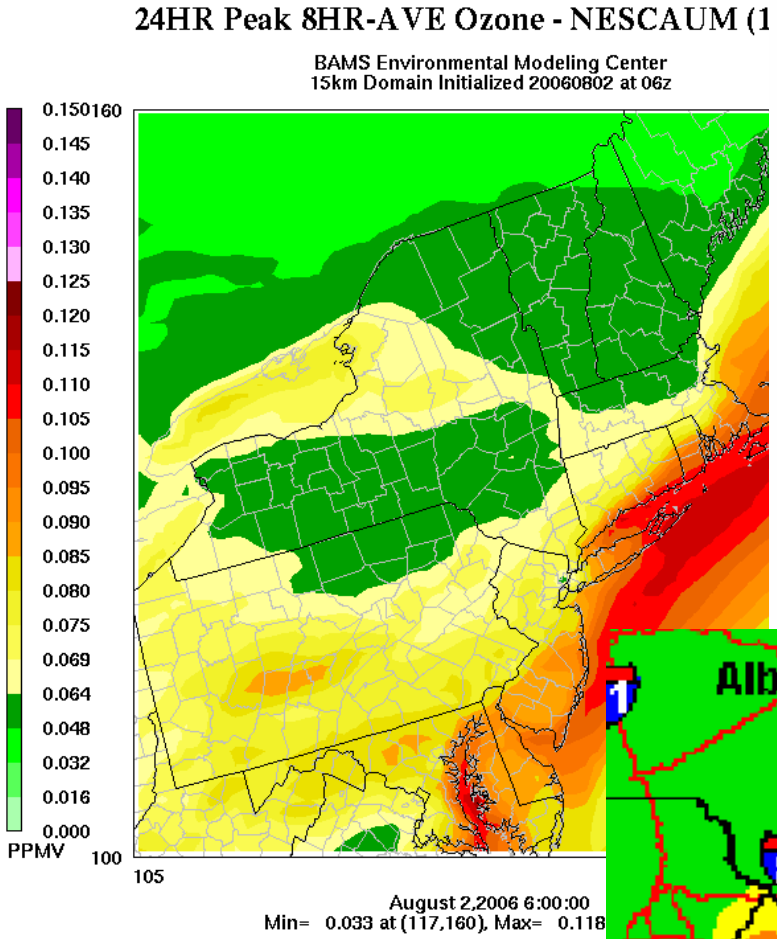


August 02 , 2006



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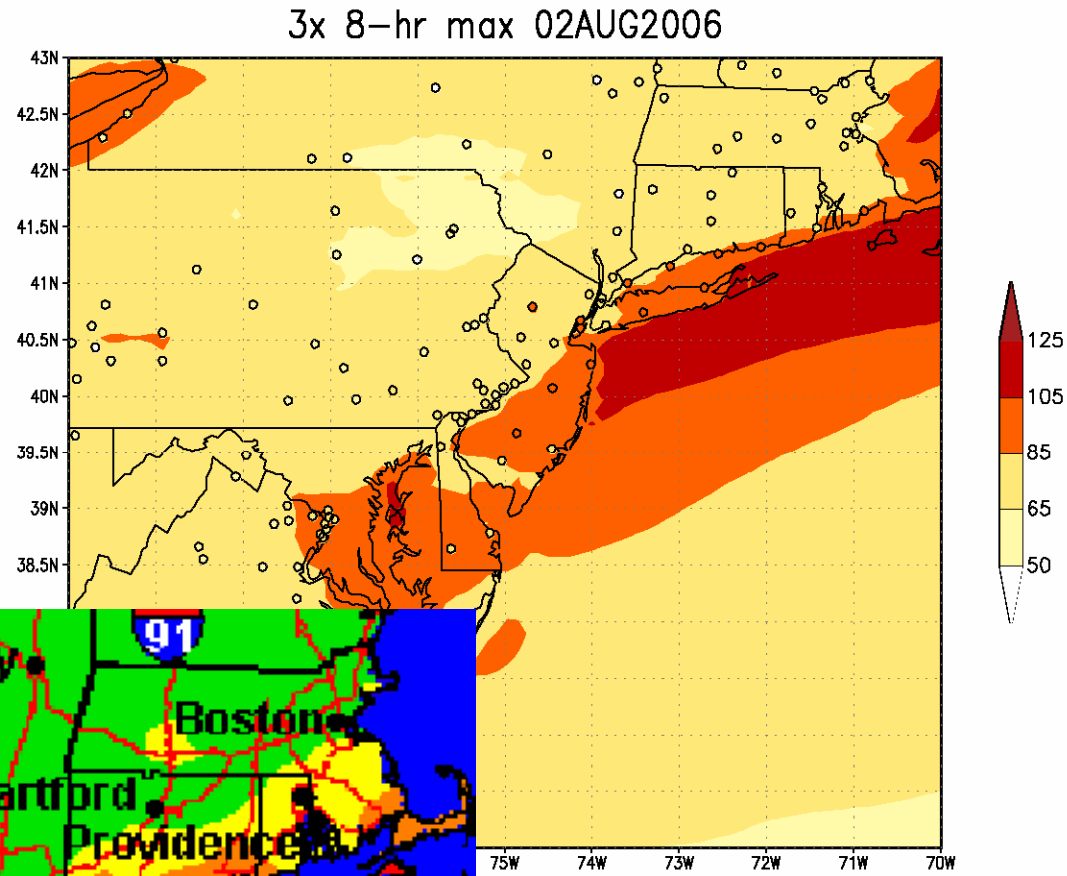

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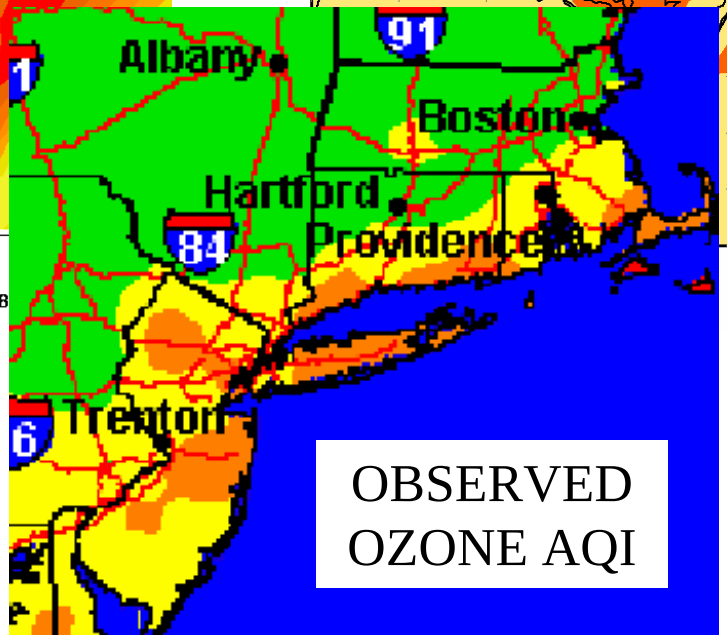
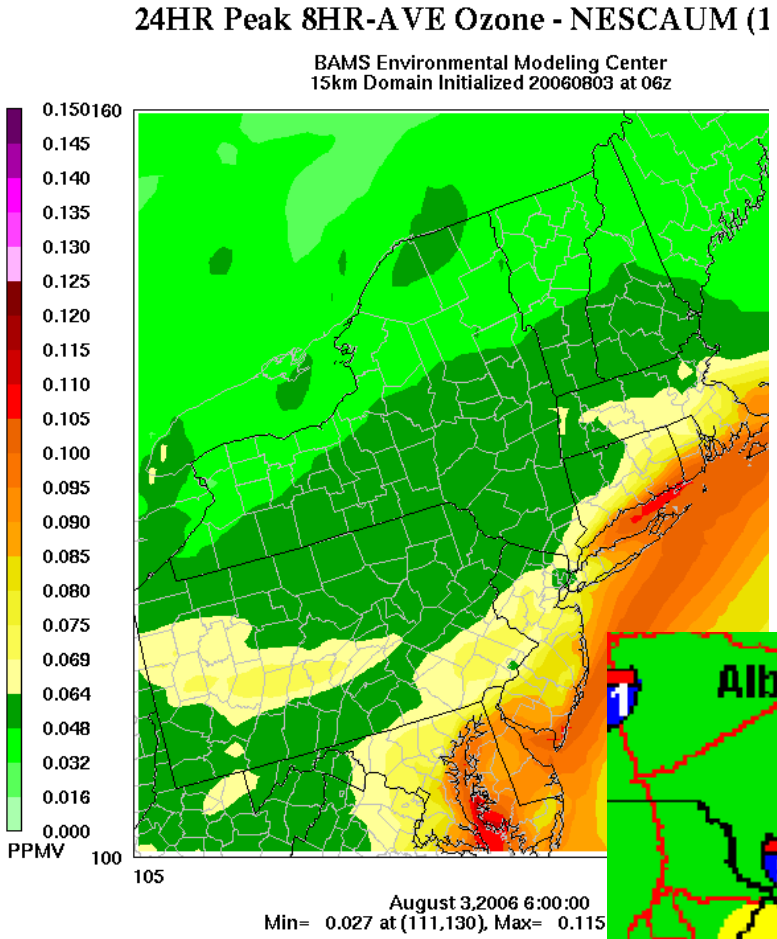


August 03 , 2006



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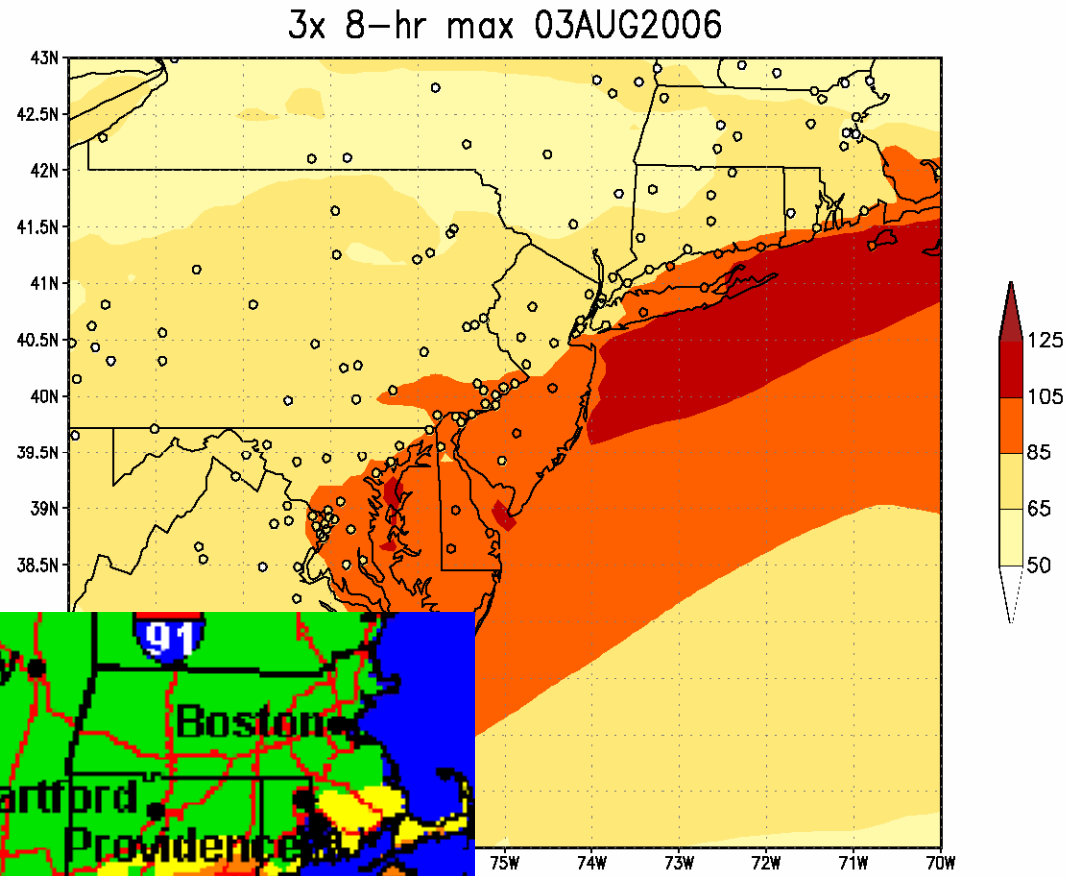

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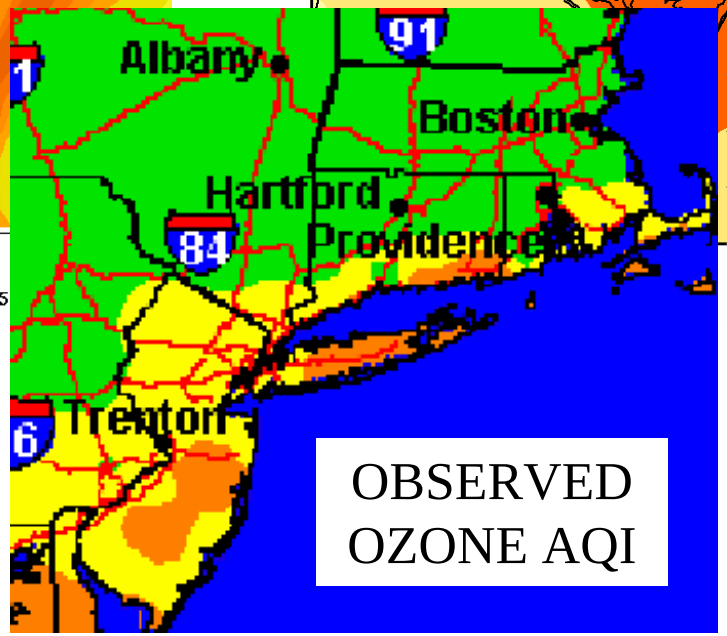
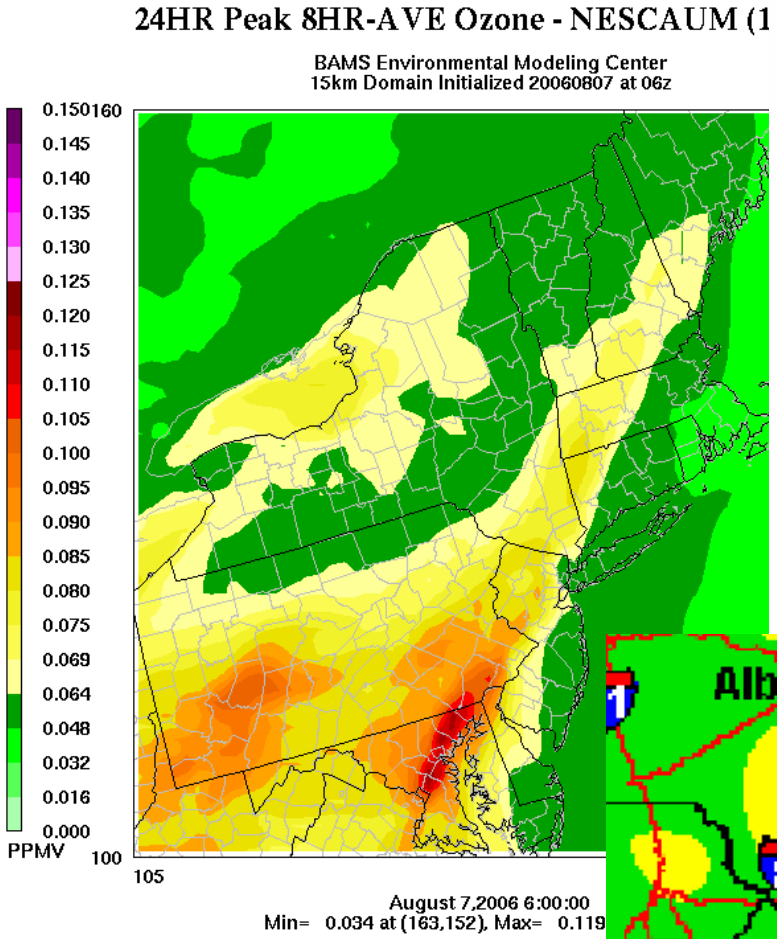


OBSERVED
OZONE AQI

August 07 , 2006



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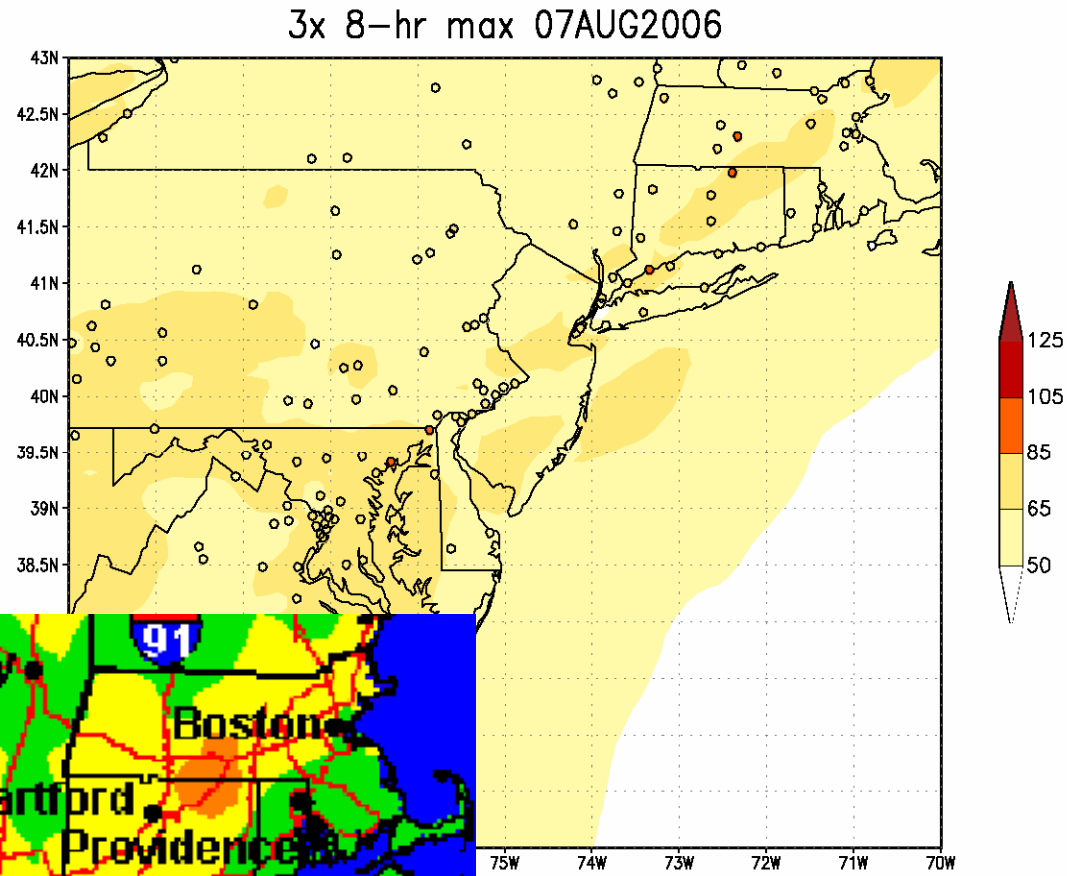

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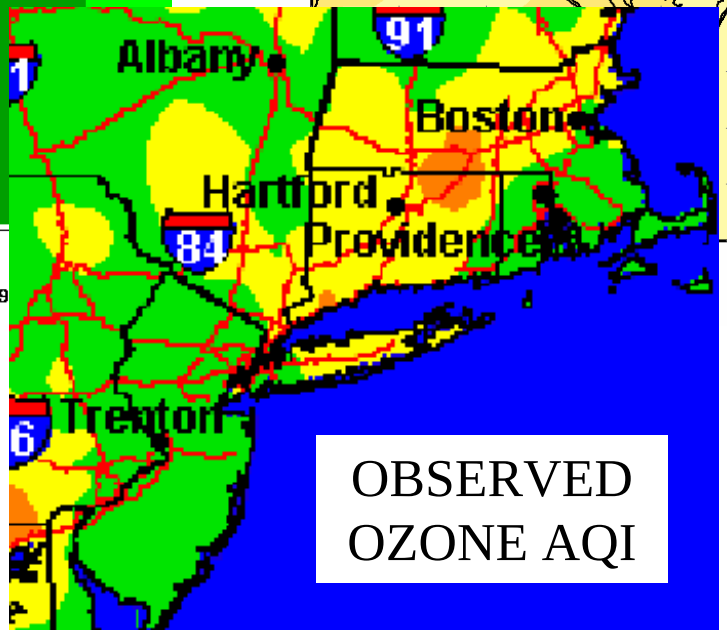
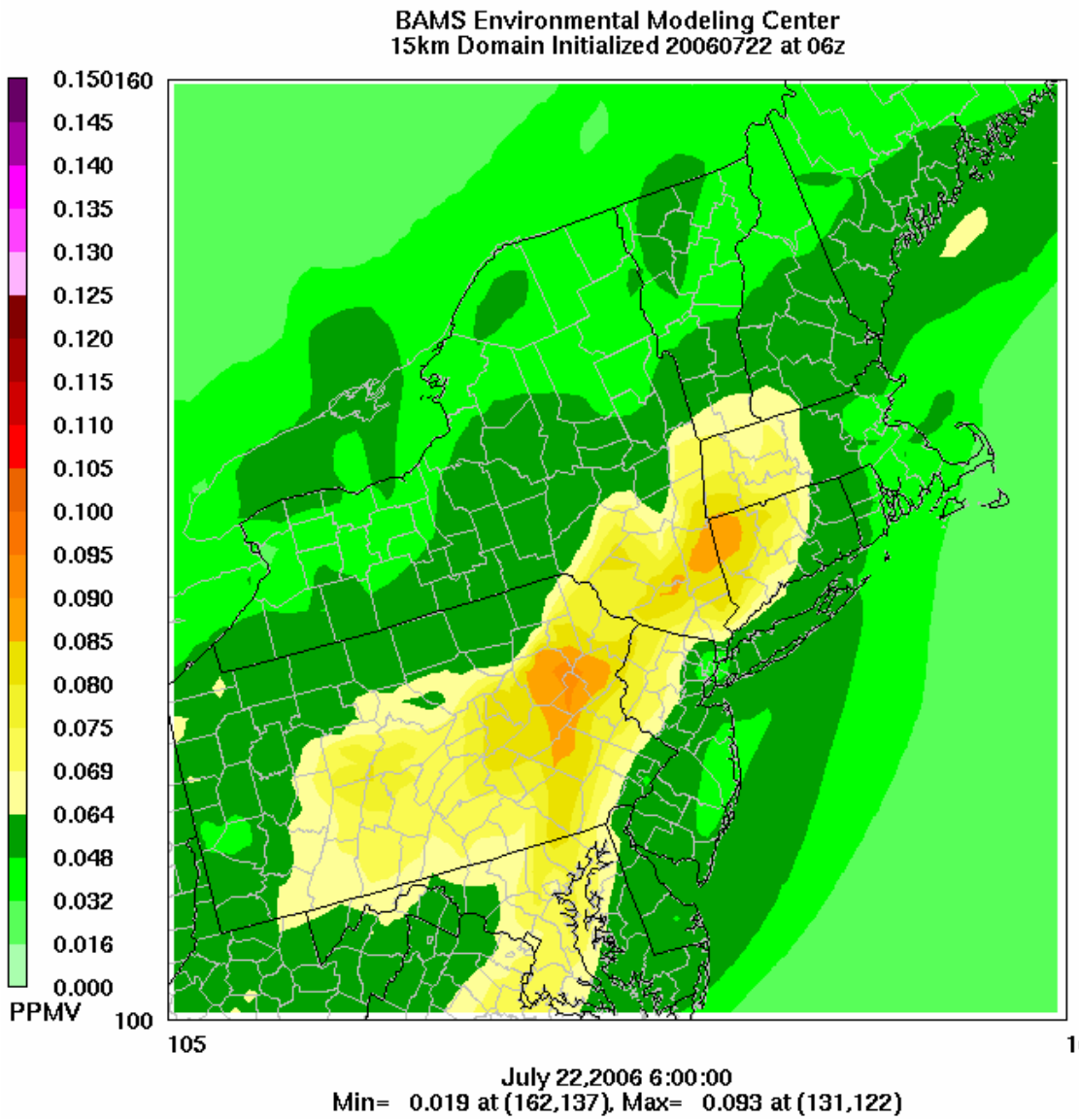


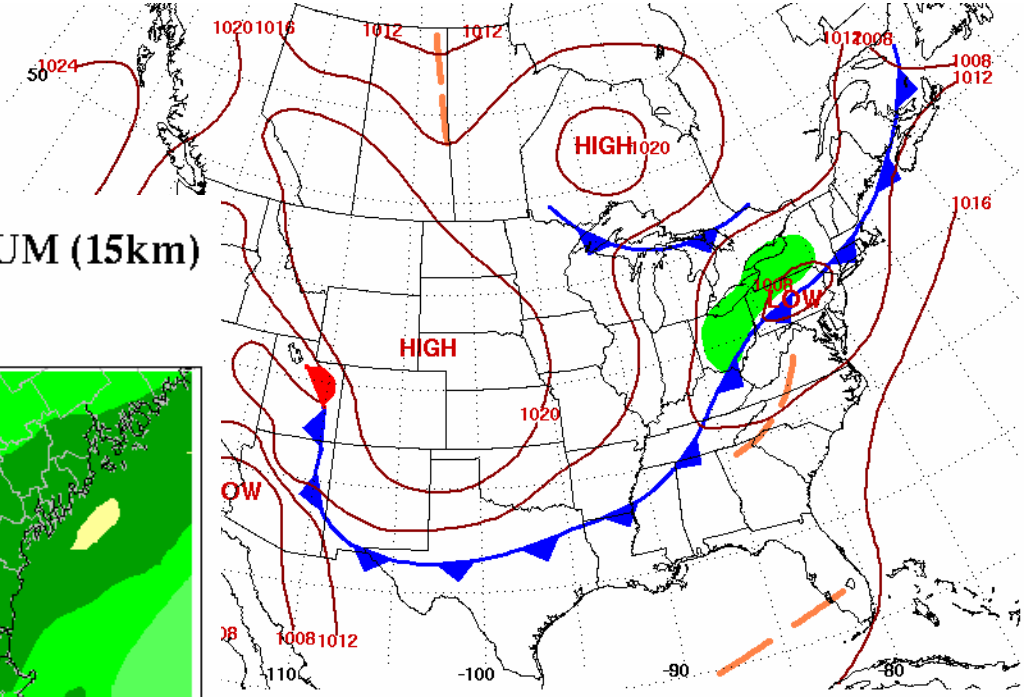
OBSERVED
OZONE AQI

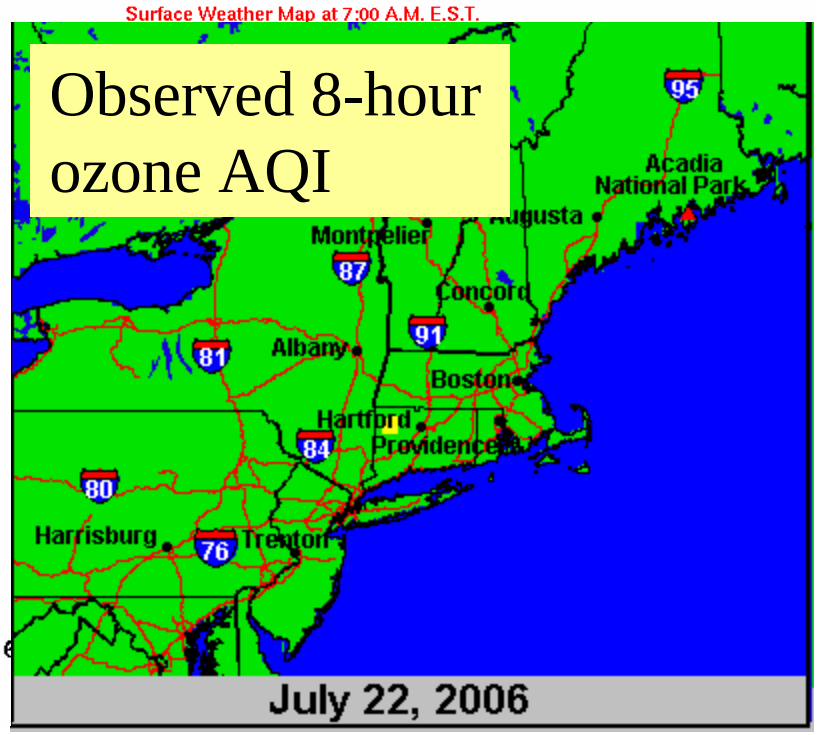
Summary Table for Connecticut
USG or Greater Exceedance Days

Observed Exceedances = 13 days	MAQSIP	NOAA
Predicted Exceedances	11	8
% Accuracy (USG days)	84.6%	61.5%
False Alarm Days	11	3

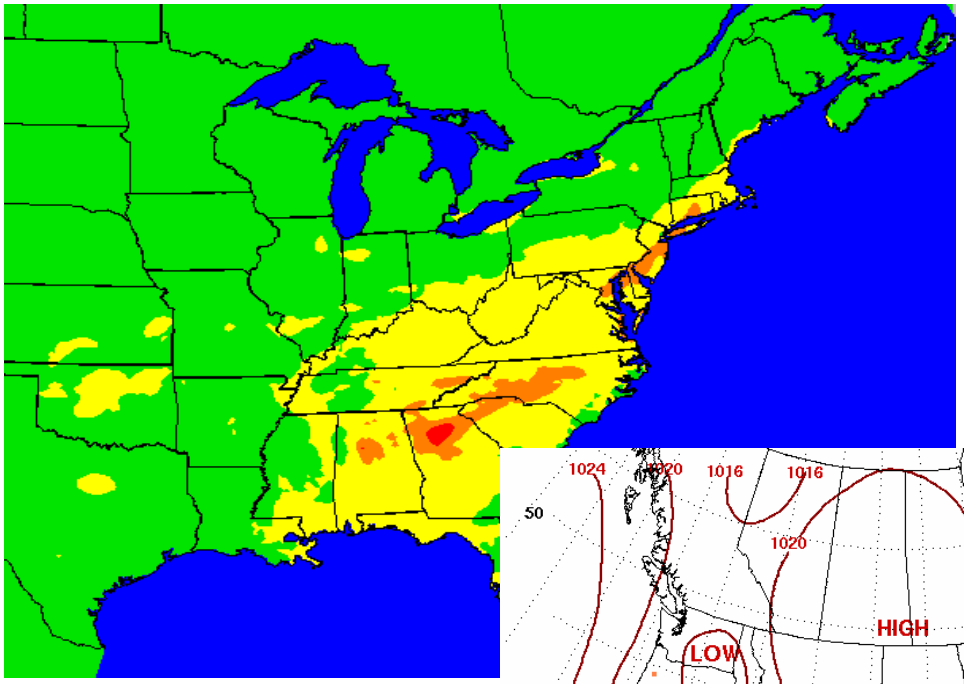
Case of MAQSIP Over-Prediction



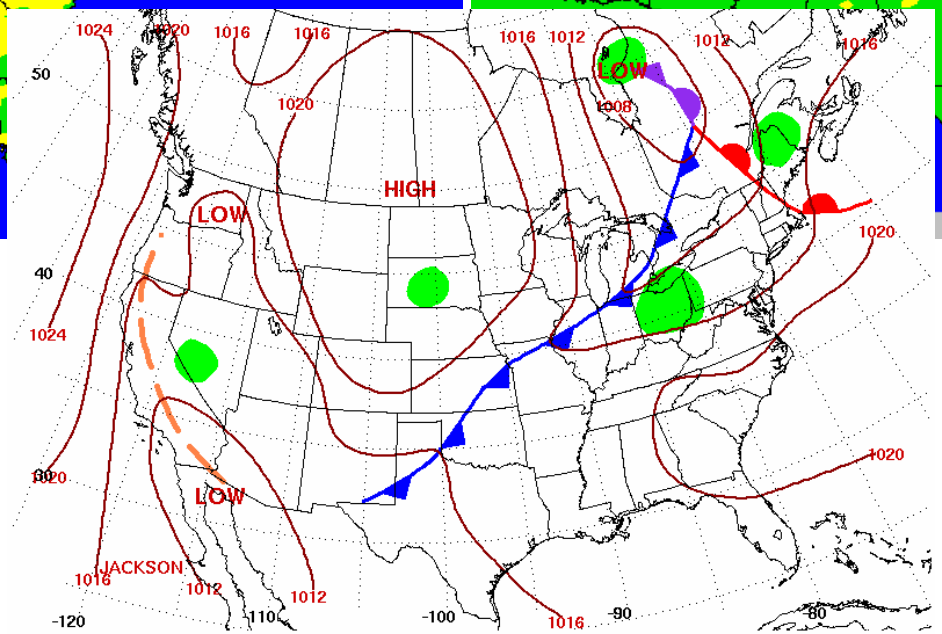


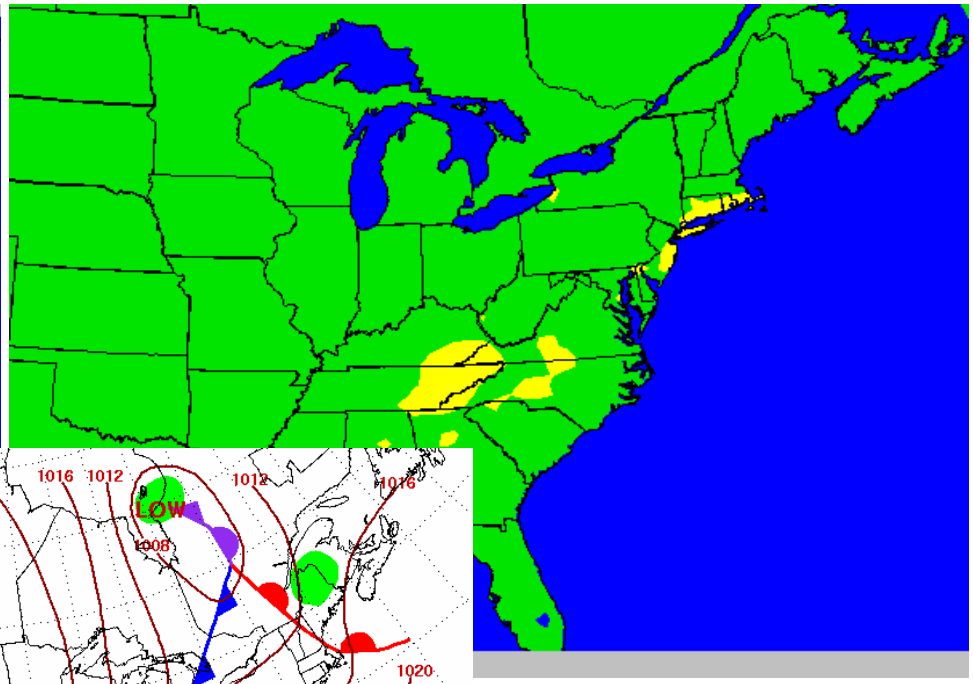


Case of NOAA Model 8-hour Ozone Over-Prediction for July 4, 2006



Forecast





Observed

Conclusions

•Compared with last year, the models have reversed their bias for CT. (MAQSIP had 37% USG accuracy, NWS had 82% USG accuracy last year)

•MAQSIP had as many false positives for USG predictions, making it about 50% reliable for USG forecasts. However, when a widespread USG event was expected, it performed well.

•The NOAA model tended to suppress the Long Island Sound plume slightly further south and less intense than last year, as well as under predicting many widespread events. Different model meteorology used for this year (WRF).

•With use of other forecasting tools, such as trajectories, it was possible to use MAQSIP to best advantage this past season, even with the over-prediction bias.