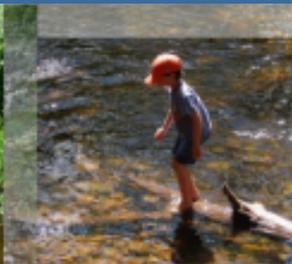




# Connecticut Department of Energy and Environmental Protection



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

# Ozone Analysis for September 8, 2016 and Model Evaluation for Connecticut

Michael Geigert  
CT DEEP



Connecticut Department of Energy and Environmental Protection

# Ozone Exceedances Only in CT

Site	Site AQS	Date (LST)	Max 8-hr Ozone ppb
Danbury	090011123	9/8/2016	80
Cornwall	090050005	9/8/2016	75
Westport	090019003	9/8/2016	71
Colliers Mills	340290006	9/8/2016	70
Greenwich	090010017	9/8/2016	69
White Plains	361192004	9/8/2016	69
KILLENS	100010002	9/8/2016	68
Stratford	090013007	9/8/2016	65
Leonia	340030006	9/8/2016	64
Middletown	090070007	9/8/2016	64
PG Equestrian C	240338003	9/8/2016	64
Horn Point	240190004	9/8/2016	63
BELLFNT2	100031013	9/8/2016	62
Blackwater NWR	240199991	9/8/2016	62
Flemington	340190001	9/8/2016	62
Rutgers Univers	340230011	9/8/2016	62
BRIS	420170012	9/8/2016	61
Clarksboro	340150002	9/8/2016	61
East Hartford	090031003	9/8/2016	61
LEWES	100051003	9/8/2016	61
Millington	240290002	9/8/2016	61
Padonia	240051007	9/8/2016	61
Rider Universit	340210005	9/8/2016	61
Rockland Cty	360870005	9/8/2016	61



C

Protection

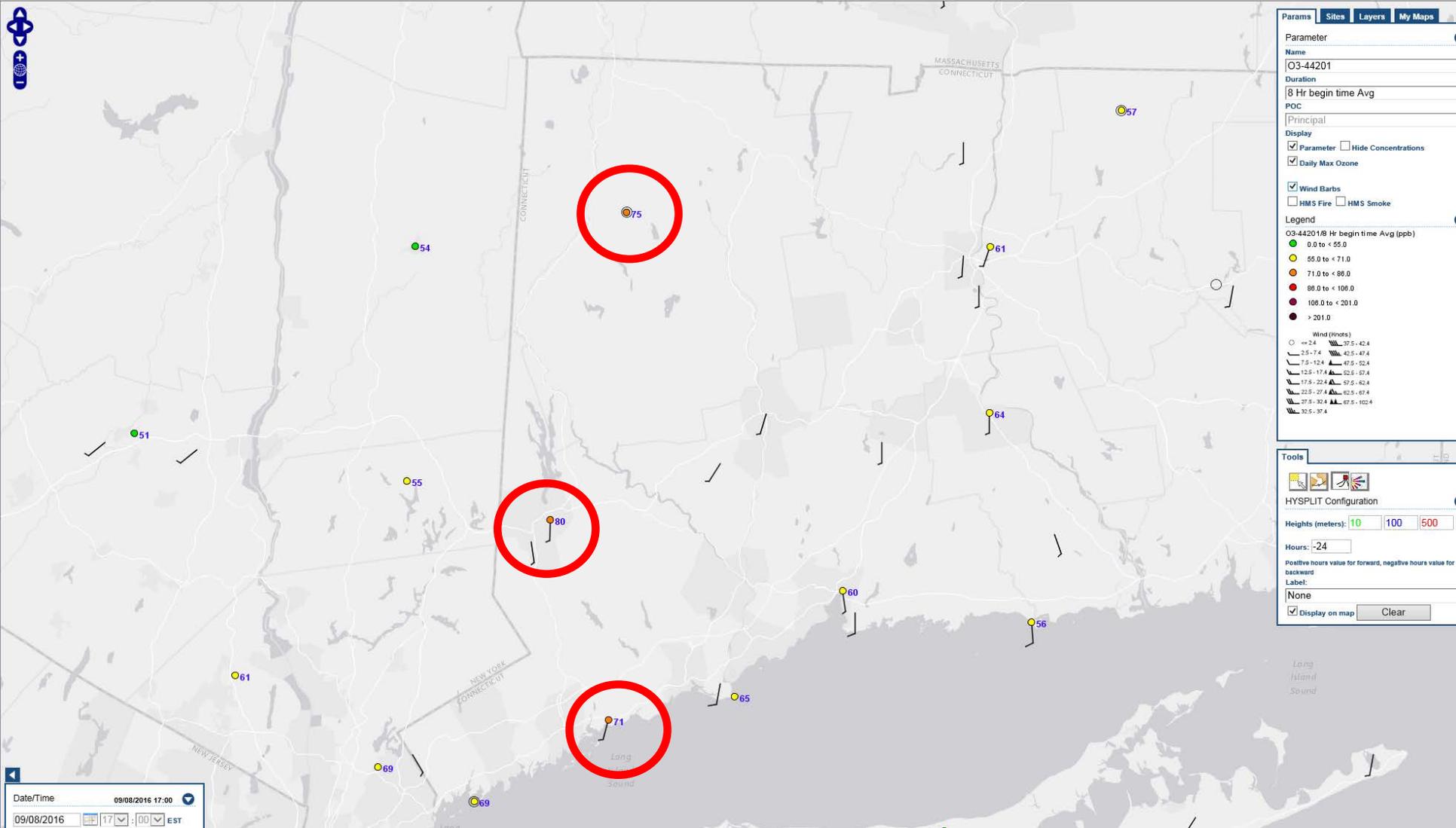
# CT Monitoring Site Design Value Update

- Connecticut has 30 exceedance days to date
- No change to table with this episode

		To Date 2016 Compliance Status x = Violating NAAQS				
	Site Name	To Date: 2016 DV	2015 NAAQS	2008 NAAQS	1997 NAAQS	Next Possible NAAQS in Violation (key monitor in each NA is highlighted in RED)
SWCT Portion of NYC Area	Danbury	78	X	X		Four more 102+ ppb days violates 1997 NAAQS
	Greenwich	82	X	X		Four more 93+ ppb days violates 1997 NAAQS
	Madison	76	X	X		Four more 105+ ppb days violates 1997 NAAQS
	Middletown	79	X	X		Three more 97+ ppb days violates 1997 NAAQS
	New Haven - Criscuolo Park	76	X	X		Four more 101+ ppb days violates 2008 NAAQS
	Stratford	81	X	X		Three more 95+ ppb days violates 1997 NAAQS
	Westport	85	X	X	X	Violates all NAAQS
Greater CT	Cornwall	72	X			Three more 86+ ppb days violates 2008 NAAQS <b>One more 76+ ppb days violates 2008 NAAQS</b>
	East Hartford	75	X			
	Groton Fort Griswold	72	X			Three more 86+ ppb days violates 2008 NAAQS
	Stafford	73	X			Three more 79+ ppb days violates 2008 NAAQS
	Abington (CASTNET)	68				One more 76+ ppb days violates 2015 NAAQS



# Ozone Exceedances Only in CT



Params Sites Layers My Maps

Parameter  
Name  
03-44201  
Duration  
8 Hr begin time Avg  
POC  
Principal  
Display  
 Parameter  Hide Concentrations  
 Daily Max Ozone  
 Wind Barbs  
 HMS Fire  HMS Smoke

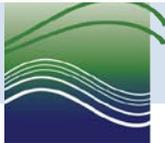
Legend  
03-44201/8 Hr begin time Avg (ppb)  
● 0.0 to < 55.0  
● 55.0 to < 71.0  
● 71.0 to < 88.0  
● 88.0 to < 106.0  
● 106.0 to < 201.0  
● > 201.0

Wind (knots)  
○ 0-2.4  
○ 2.5-7.4  
○ 7.5-12.4  
○ 12.5-17.4  
○ 17.5-22.4  
○ 22.5-27.4  
○ 27.5-32.4  
○ 32.5-37.4

Tools

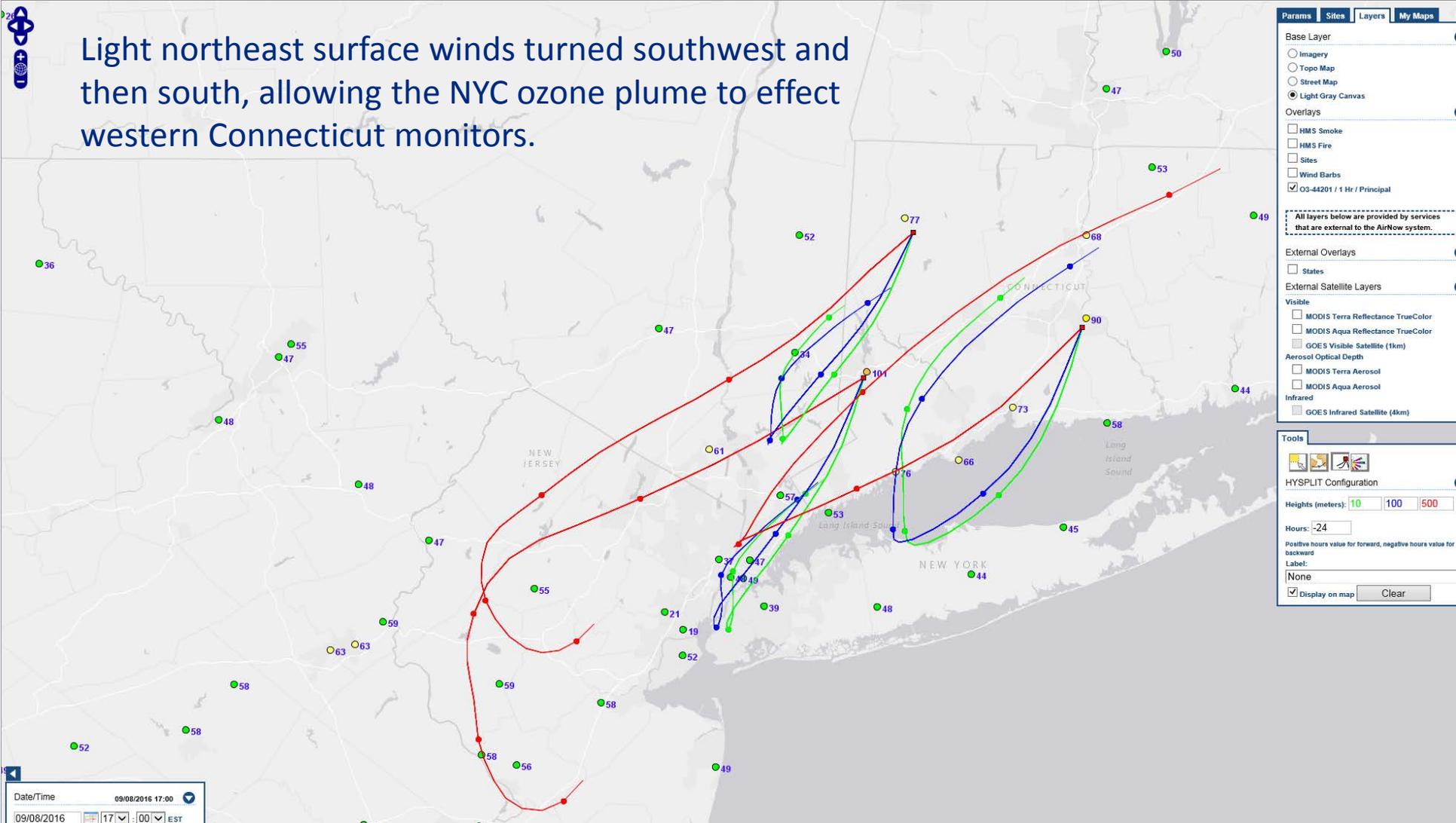
HYSPLIT Configuration  
Heights (meters): 10 100 500  
Hours: -24  
Positive hours value for forward, negative hours value for backward  
Label: None  
 Display on map Clear

Date/Time 09/08/2016 17:00  
09/08/2016 17:00 EST



# 24 Hour Back Trajectories

Light northeast surface winds turned southwest and then south, allowing the NYC ozone plume to effect western Connecticut monitors.

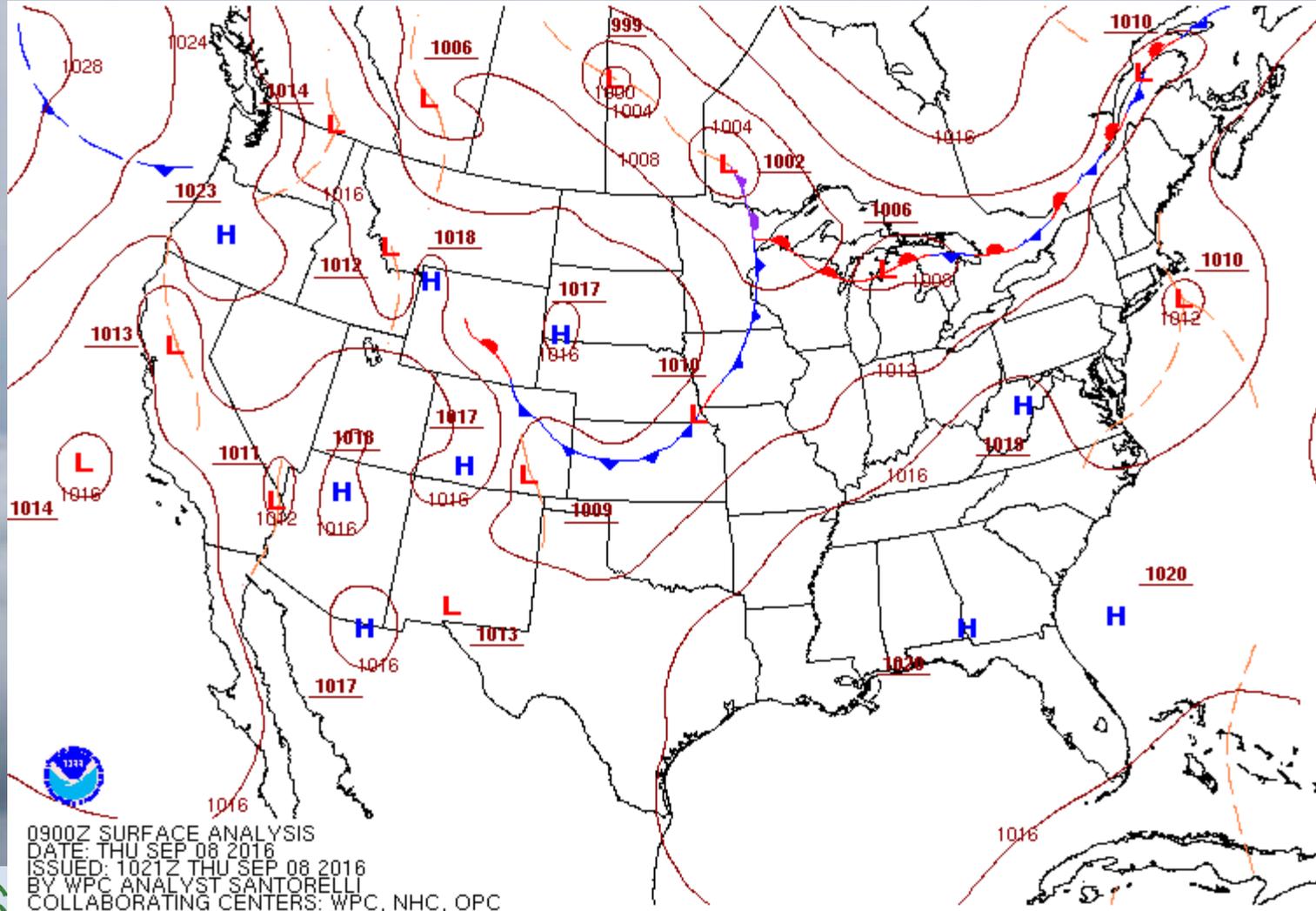


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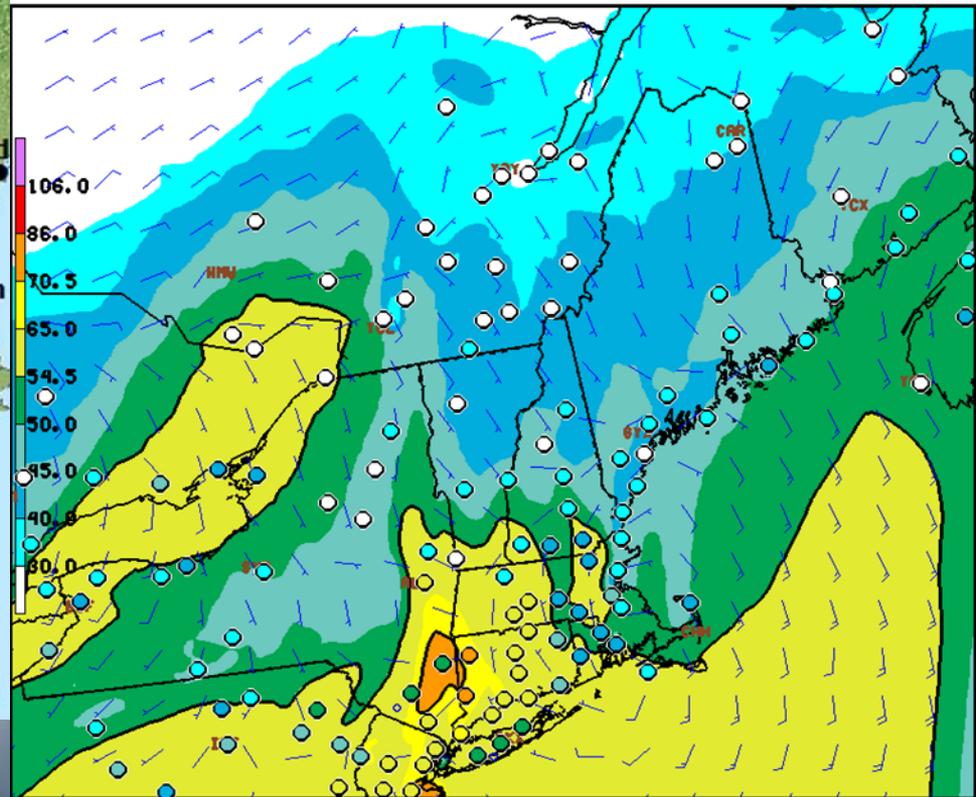
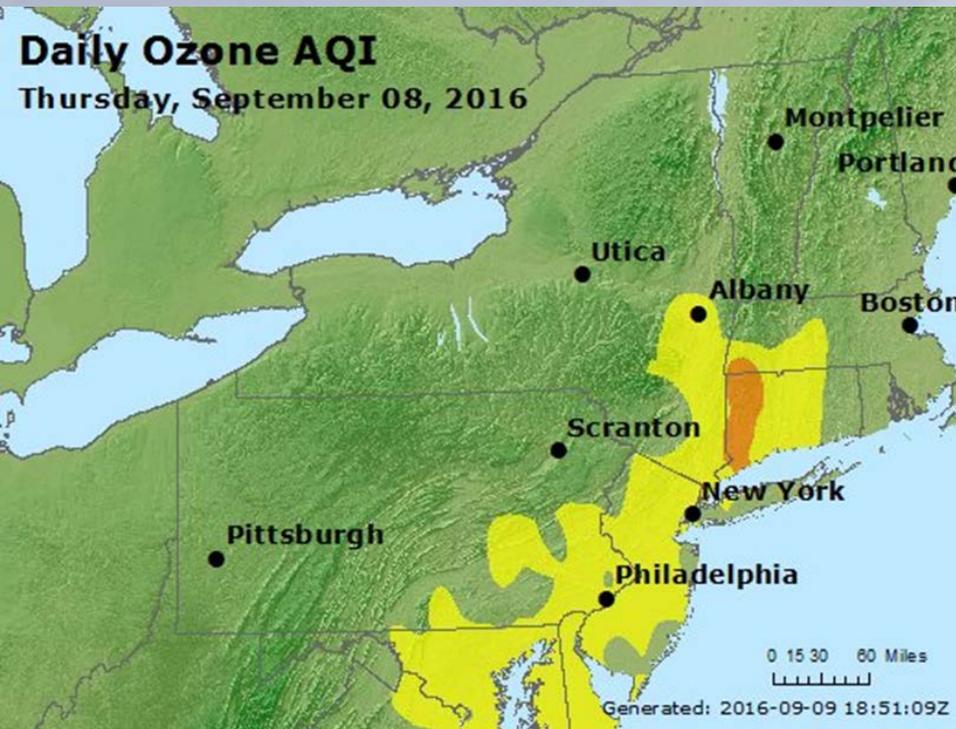
# September 8, 2016 Surface Animation

A weak pressure gradient allowed local transport from the NYC area to affect western CT.



# NOAA Model Evaluation

- Day before NOAA model hinted at USG event in far western Connecticut



PROD DAY2 OZHX08 0 20160907 06Z CYC-



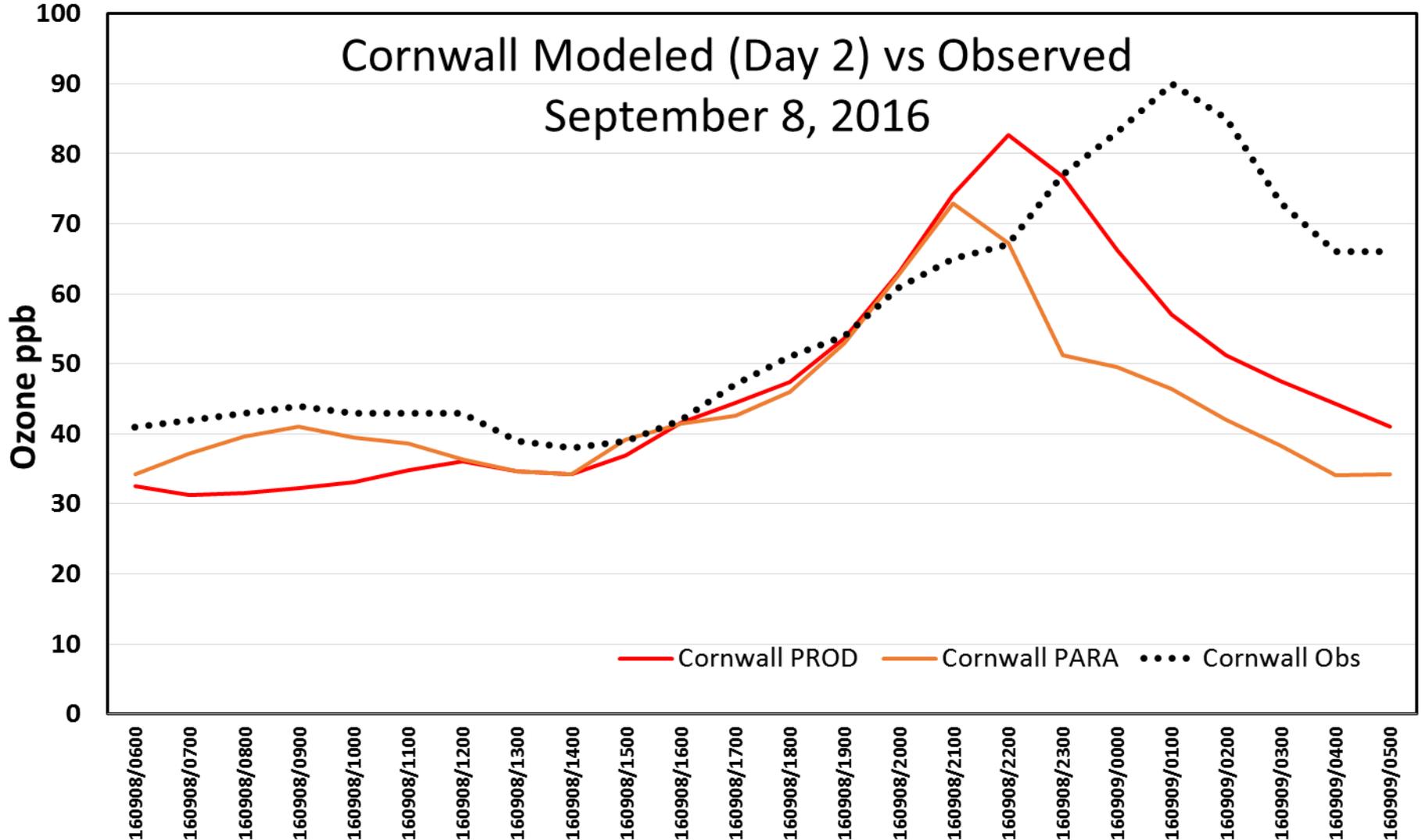
# NOAA PROD vs. the PARA Model

- NOAA began running a new experimental parallel model (PARA) in July 2016 and asked the State forecasters to evaluate it;
- The NOAA production model (PROD) has been over-predicting ozone during July-August;
- The new PARA model is using an inventory where mobile NO<sub>x</sub> emissions have been cut up to 20%, in order to better match satellite observations;
- The PARA model greatly under-predicted ozone levels for this event in Connecticut



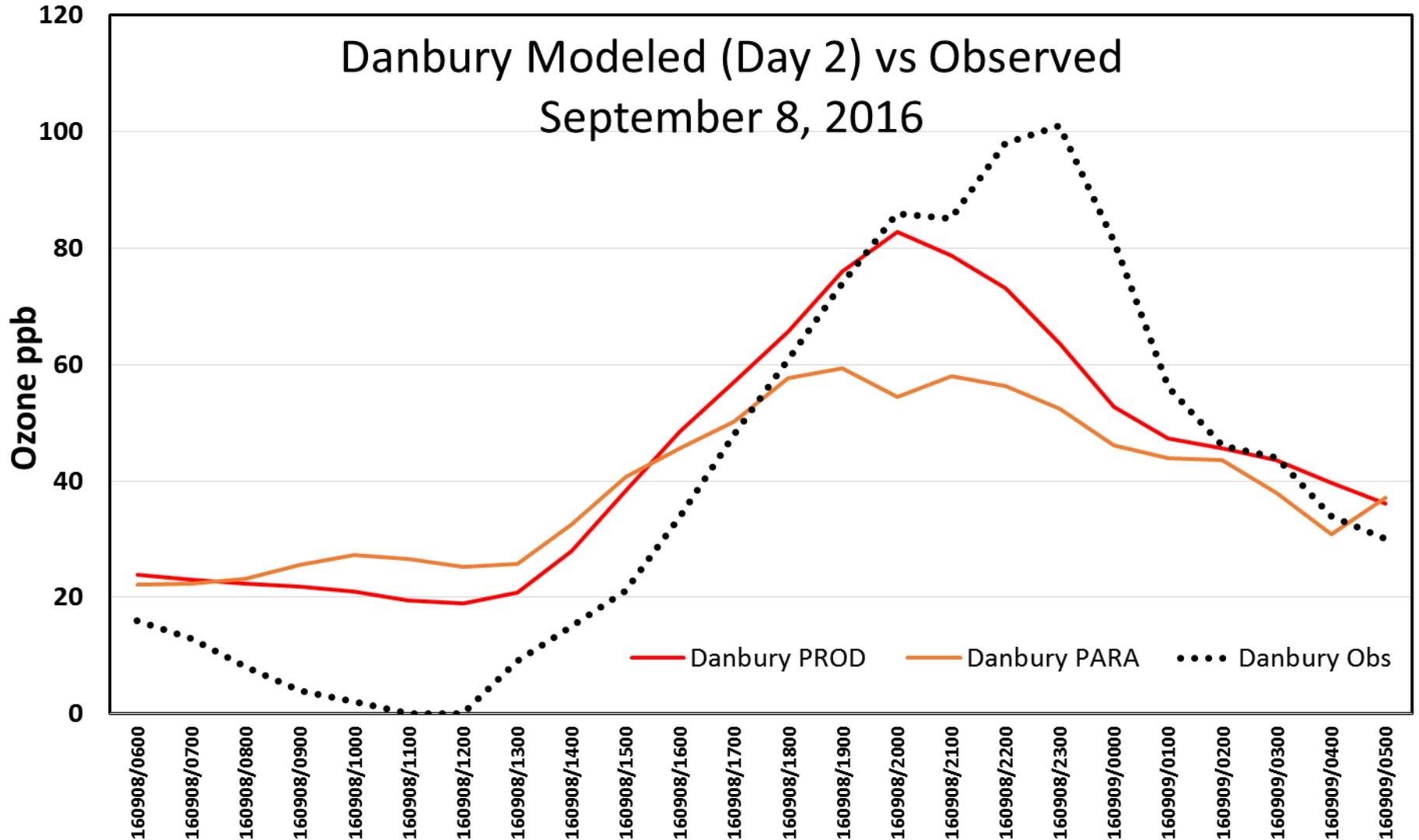
# Cornwall PROD vs. PARA (Experimental)

- The NOAA PARA model under-predicted more than the PROD, from 5:00pm (2100z)- Midnight.



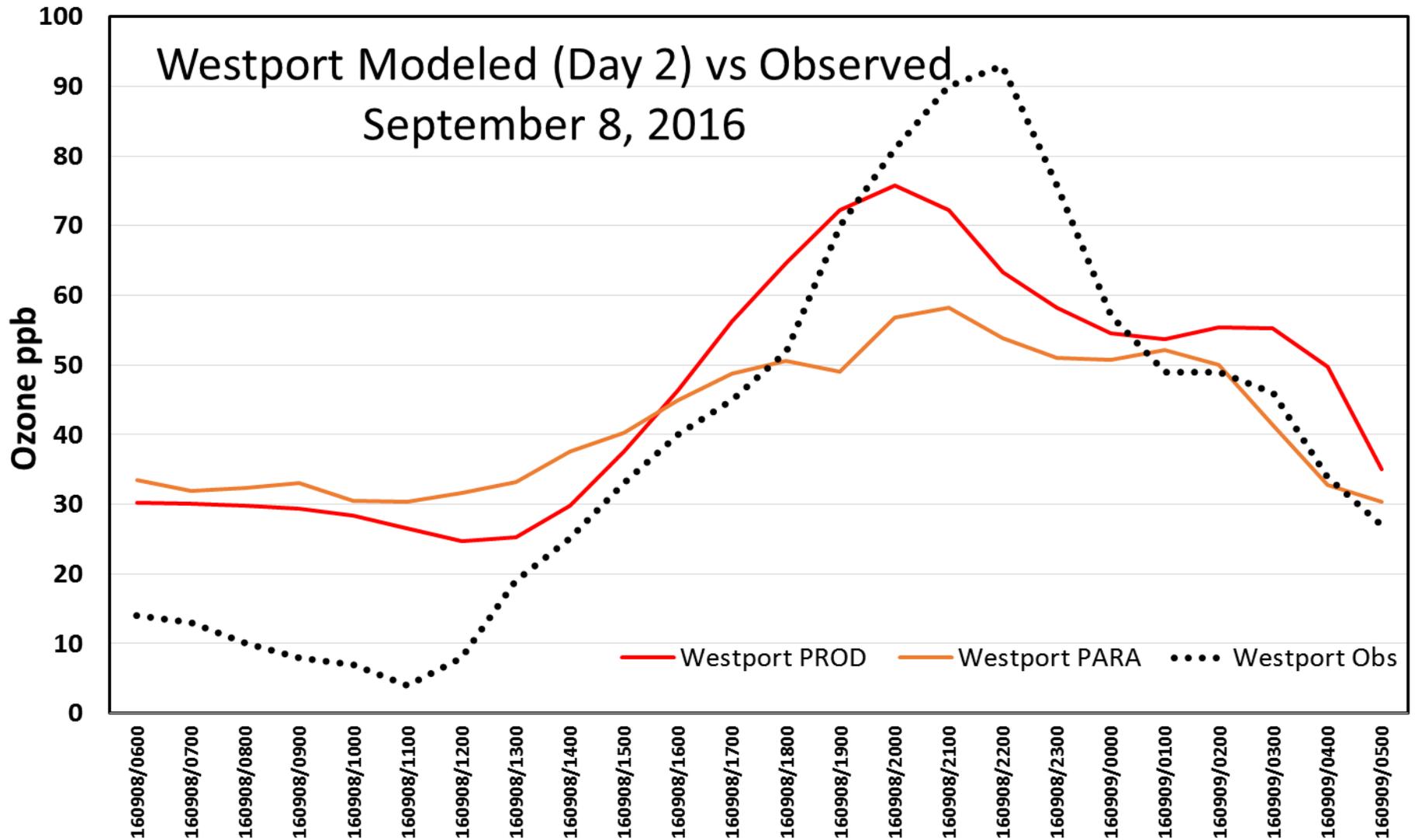
# Danbury PROD vs. PARA(Experimental)

- PARA under-predicted most from 2:00 pm- 8:00pm, during peak ozone production



# Westport PROD vs. PARA(Experimental)

- PARA under-predicted most from 1:00 pm- 7:00pm, during peak ozone production



# Conclusions

- This was a CT only USG event, with light southwest winds providing local transport from the NYC metro area;
- Cornwall ozone peaked later in the day after being transported in from the NYC area.
- The new PARA model under-predicted peak ozone production for the three monitors that exceeded the NAAQS;
- The PROD model had a slight under-prediction, but performed better than the PARA and thus offered forecasters superior guidance.

