

**Attachment D**

**Ozone Transport Region Trajectory Analyses for Ozone  
Exceedances**

**Between April 1, 2011 and June 15, 2015**

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This attachment contains trajectory analyses conducted by DAQ on exceedance days observed at downwind sites over the Ozone Transport Region. Below is a table of contents of these analyses. The page numbers in the table of contents refer to the page number of this Portable Document Format (PDF) file.

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Attachment D2. Trajectories and Other Data on Ozone Exceedance Days for select Northeastern U.S. Ozone Monitor sites from 2011 to June 15, 2015.....21

**Attachment D1**

**Ozone Exceedance Days Between April 1, 2011 and June 15, 2015**



**Attachment D1. Ozone Exceedance Analyses Between April 1, 2011 and June 15, 2015**

Date	Site	8-hour Ozone Value	NC Impact?	Trajectory Heights						
				10	100	500	1000	1500	2000	
5/26/2011	Lebanon	77	Yes		X	X	X			X
5/31/2011	Essex	79	No							
5/31/2011	Edgewood	80	No							
6/1/2011	Fair Hill	92	Yes	X			X			
6/1/2011	Edgewood	79	Yes				X			
6/1/2011	Clarksboro	83	Yes				X	X		
6/1/2011	Wagner	89	Yes				X			
6/1/2011	BRIS	85	Yes					X		
6/1/2011	NEWG	78	Yes	X			X			
6/1/2011	NEA	94	Yes					X		
6/1/2011	BAX	89	Yes					X		
6/6/2011	Wagner	77	No							
6/7/2011	Fair Hill	89	No							
6/7/2011	Essex	83	No							
6/7/2011	Edgewood	89	No							
6/7/2011	Ancona	82	No							
6/7/2011	Clarksboro	95	No							
6/7/2011	Wagner	82	No							
6/7/2011	Babylon	81	No							
6/7/2011	BRIS	81	No							
6/7/2011	NEWG	87	No							
6/7/2011	NEA	89	No							
6/7/2011	Greenwich	87	No							
6/7/2011	Stratford	92	No							
6/7/2011	Westport	92	No							
6/7/2011	Middletown	80	No							
6/7/2011	Groton Fort Griswold	82	No							
6/8/2011	Fair Hill	94	No							
6/8/2011	Edgewood	114	No							
6/8/2011	Essex	101	No							
6/8/2011	PG Equestrian Center	95	No							
6/8/2011	Ancona	97	No							
6/8/2011	Clarksboro	93	No							
6/8/2011	Wagner	85	No							

Date	Site	8-hour Ozone Value	NC Impact?	Trajectory Heights					
				10	100	500	1000	1500	2000
6/8/2011	Babylon	89	No						
6/8/2011	BRIS	80	No						
6/8/2011	NEWG	90	No						
6/8/2011	Lebanon	76	No						
6/8/2011	NEA	92	No						
6/8/2011	W Greenwich	78	No						
6/8/2011	E Providence	78	No						
6/8/2011	Greenwich	93	No						
6/8/2011	Stratford	95	No						
6/8/2011	Westport	101	No						
6/8/2011	Middletown	85	No						
6/8/2011	Groton Fort Griswold	80	No						
6/9/2011	Essex	83	No						
6/9/2011	Fair Hill	92	No						
6/9/2011	Edgewood	106	No						
6/9/2011	PG Equestrian Center	86	No						
6/9/2011	Ancona	96	No						
6/9/2011	Clarksboro	102	No						
6/9/2011	Wagner	93	No						
6/9/2011	Babylon	104	No						
6/9/2011	BRIS	82	No						
6/9/2011	NEWG	79	No						
6/9/2011	Lebanon	82	No						
6/9/2011	NEA	93	No						
6/9/2011	Greenwich	79	No						
6/9/2011	Stratford	84	No						
6/9/2011	Westport	87	No						
6/10/2011	Essex	81	No						
6/10/2011	Fair Hill	76	No						
6/10/2011	Edgewood	87	No						
6/10/2011	PG Equestrian Center	92	No						
6/10/2011	Clarksboro	88	No						
6/10/2011	NEWG	78	No						
6/10/2011	NEA	81	No						
6/18/2011	PG Equestrian Center	76	No						
6/21/2011	E Providence	76	No						



Date	Site	8-hour Ozone Value	NC Impact?	Trajectory Heights						
				10	100	500	1000	1500	2000	
7/10/2011	NEA	77	No							
7/11/2011	W Greenwich	81	No							
7/11/2011	Greenwich	77	No							
7/11/2011	Stratford	88	No							
7/11/2011	Westport	86	No							
7/11/2011	Middletown	90	No							
7/11/2011	Groton Fort Griswold	79	No							
7/11/2011	Stafford	87	No							
7/16/2011	Babylon	88	No							
7/16/2011	Greenwich	76	No							
7/16/2011	Westport	79	No							
7/16/2011	Groton Fort Griswold	78	No							
7/18/2011	Fair Hill	86	Yes	X	X	X				
7/18/2011	Edgewood	82	Yes	X	X	X				
7/18/2011	PG Equestrian Center	80	Yes	X	X	X				
7/18/2011	Wagner	77	Yes	X	X					
7/18/2011	Babylon	77	Yes			X	X			
7/18/2011	BRIS	81	Yes	X	X					
7/18/2011	NEWG	79	Yes	X	X	X	X			
7/18/2011	NEA	87	Yes	X	X	X				
7/18/2011	Stratford	82	Yes	X	X					
7/18/2011	Groton Fort Griswold	83	Yes	X			X			
7/19/2011	Ancona	77	Yes	X						
7/19/2011	Clarksboro	92	No							
7/19/2011	Babylon	76	No							
7/20/2011	Lebanon	80	No							
7/21/2011	Wagner	79	No							
7/21/2011	Lebanon	85	No							
7/21/2011	NEA	85	Yes	X	X					
7/21/2011	Westport	77	Yes	X	X					
7/21/2011	Middletown	79	Yes	X	X					
7/21/2011	Stafford	82	Yes		X					
7/22/2011	Fair Hill	88	No							
7/22/2011	Essex	84	No							
7/22/2011	Edgewood	97	No							
7/22/2011	PG Equestrian Center	90	No							



Date	Site	8-hour Ozone Value	NC Impact?	Trajectory Heights						
				10	100	500	1000	1500	2000	
5/28/2012	Babylon	79	No							
6/10/2012	Fair Hill	87	No							
6/10/2012	Essex	83	No							
6/10/2012	Edgewood	85	No							
6/10/2012	PG Equestrian Center	80	No							
6/10/2012	Ancona	82	No							
6/10/2012	Clarksboro	87	No							
6/10/2012	BRIS	82	No							
6/10/2012	NEWG	81	No							
6/10/2012	Lebanon	77	No							
6/10/2012	NEA	86	No							
6/20/2012	Fair Hill	82	No							
6/20/2012	Essex	83	No							
6/20/2012	Edgewood	89	No							
6/20/2012	PG Equestrian Center	81	No							
6/20/2012	Ancona	92	No							
6/20/2012	Wagner	76	No							
6/20/2012	Babylon	95	No							
6/20/2012	BRIS	76	No							
6/20/2012	NEWG	77	No							
6/20/2012	NEA	80	No							
6/20/2012	Greenwich	90	No							
6/20/2012	Stratford	97	No							
6/20/2012	Westport	89	No							
6/20/2012	Groton Fort Griswold	87	No							
6/21/2012	Fair Hill	87	No							
6/21/2012	Essex	90	No							
6/21/2012	Edgewood	86	No							
6/21/2012	PG Equestrian Center	91	No							
6/21/2012	Ancona	97	No							
6/21/2012	Wagner	82	No							
6/21/2012	Babylon	86	No							
6/21/2012	BRIS	79	No							
6/21/2012	NEWG	80	No							
6/21/2012	NEA	84	No							
6/21/2012	Greenwich	82	No							



Date	Site	8-hour Ozone Value	NC Impact?
6/29/2012	E Providence	84	No
6/29/2012	Stratford	90	No
6/29/2012	Westport	78	No
6/29/2012	Middletown	76	No
6/29/2012	New Haven	79	No
6/29/2012	Groton Fort Griswold	104	No
6/30/2012	Fair Hill	76	No
6/30/2012	Ancona	76	No
6/30/2012	Clarksboro	76	No
6/30/2012	Babylon	78	No
6/30/2012	Stratford	82	No
6/30/2012	Groton Fort Griswold	83	No
7/1/2012	Ancona	77	No
7/1/2012	Clarksboro	79	No
7/1/2012	Babylon	83	No
7/1/2012	NEA	78	No
7/1/2012	Greenwich	80	No
7/1/2012	Stratford	93	No
7/1/2012	Westport	91	No
7/1/2012	New Haven	89	No
7/1/2012	Groton Fort Griswold	76	No
7/3/2012	PG Equestrian Center	81	No
7/4/2012	Fair Hill	79	No
7/4/2012	PG Equestrian Center	80	No
7/4/2012	Ancona	80	No
7/4/2012	Clarksboro	78	No
7/4/2012	Stratford	78	No
7/4/2012	New Haven	78	No
7/5/2012	PG Equestrian Center	90	No
7/6/2012	Essex	83	No
7/6/2012	PG Equestrian Center	81	No
7/6/2012	Ancona	93	No
7/6/2012	NEA	78	No
7/6/2012	Greenwich	76	No
7/6/2012	Westport	77	No
7/7/2012	Fair Hill	79	No

Trajectory Heights					
10	100	500	1000	1500	2000



Date	Site	8-hour Ozone Value	NC Impact?
7/7/2012	Edgewood	80	No
7/7/2012	PG Equestrian Center	81	No
7/7/2012	Ancona	90	No
7/7/2012	Clarksboro	88	No
7/7/2012	BRIS	77	No
7/7/2012	NEWG	79	No
7/7/2012	NEA	82	No
7/8/2012	PG Equestrian Center	86	No
7/12/2012	Stafford	76	No
7/13/2012	Clarksboro	79	No
7/13/2012	BRIS	90	No
7/13/2012	NEA	87	No
7/13/2012	Danbury	90	No
7/13/2012	E Hartford	77	No
7/14/2012	E Providence	79	No
7/14/2012	Greenwich	79	No
7/14/2012	Stratford	88	No
7/14/2012	Westport	86	No
7/14/2012	Middletown	85	No
7/14/2012	New Haven	90	No
7/14/2012	Stafford	76	No
7/17/2012	Fair Hill	88	No
7/17/2012	Edgewood	95	No
7/17/2012	Essex	76	No
7/17/2012	PG Equestrian Center	90	No
7/17/2012	Clarksboro	82	No
7/17/2012	BRIS	80	No
7/17/2012	NEWG	86	No
7/17/2012	Lebanon	79	No
7/17/2012	NEA	80	No
7/17/2012	E Providence	80	No
7/17/2012	Greenwich	95	No
7/17/2012	Danbury	85	No
7/17/2012	Stratford	87	No
7/17/2012	Westport	93	No
7/17/2012	E Hartford	91	No

Trajectory Heights					
10	100	500	1000	1500	2000



Date	Site	8-hour Ozone Value	NC Impact?
8/3/2012	Middletown	80	No
8/3/2012	New Haven	77	No
8/8/2012	Fair Hill	80	Yes
8/8/2012	BRIS	80	Yes
8/8/2012	NEWG	79	Yes
8/8/2012	NEA	84	Yes
8/8/2012	Danbury	78	No
8/9/2012	Danbury	87	No
8/9/2012	E Hartford	76	No
8/9/2012	Middletown	76	No
8/17/2012	Greenwich	78	No
8/17/2012	Danbury	84	No
8/17/2012	Westport	76	No
8/17/2012	E Hartford	77	No
8/17/2012	Middletown	79	No
8/17/2012	Stafford	83	No
8/22/2012	Clarksboro	78	No
8/22/2012	NEA	82	No
8/22/2012	Stratford	82	No
8/22/2012	New Haven	79	No
8/23/2012	Clarksboro	82	No
8/23/2012	BRIS	79	No
8/23/2012	NEWG	79	No
8/23/2012	NEA	84	No
8/23/2012	E Providence	76	No
8/23/2012	Greenwich	77	No
8/23/2012	Westport	77	No
8/23/2012	Middletown	79	No
8/23/2012	New Haven	76	No
8/24/2012	Fair Hill	86	No
8/24/2012	Essex	76	No
8/24/2012	Edgewood	76	No
8/24/2012	Clarksboro	82	No
8/24/2012	Babylon	77	No
8/24/2012	NEWG	86	No
8/24/2012	NEA	80	No

Trajectory Heights					
10	100	500	1000	1500	2000
	X				
X	X				
X	X				
X					

Date	Site	8-hour Ozone Value	NC Impact?
8/24/2012	Stratford	81	No
8/31/2012	Ancona	81	No
8/31/2012	Clarksboro	78	No
8/31/2012	Wagner	80	No
8/31/2012	Babylon	79	No
8/31/2012	BRIS	80	No
8/31/2012	NEWG	78	No
8/31/2012	NEA	83	No
8/31/2012	W Greenwich	78	No
8/31/2012	E Providence	92	No
8/31/2012	Greenwich	89	No
8/31/2012	Stratford	95	No
8/31/2012	Westport	92	No
8/31/2012	Middletown	88	No
8/31/2012	New Haven	96	No
8/31/2012	Madison-Beach Road	100	No
8/31/2012	Groton Fort Griswold	92	No
9/13/2012	Danbury	76	No
9/13/2012	E Hartford	79	No
9/13/2012	Middletown	81	No
9/13/2012	Stafford	85	No
5/29/2013	Fair Hill	80	Yes
5/29/2013	Clarksboro	78	Yes
5/29/2013	BRIS	77	Yes
5/30/2013	Greenwich	89	Yes
5/30/2013	Stratford	94	Yes
5/30/2013	Westport	95	Yes
5/30/2013	Middletown	86	Yes
5/30/2013	Madison-Beach Road	85	Yes
5/30/2013	Groton Fort Griswold	85	Yes
5/31/2013	Lebanon	76	Yes
5/31/2013	W Greenwich	81	Yes
5/31/2013	E Providence	76	Yes
5/31/2013	Greenwich	79	Yes
5/31/2013	Danbury	79	Yes
5/31/2013	Stratford	85	Yes

Trajectory Heights					
10	100	500	1000	1500	2000
X	X				
X	X				
X	X				
X	X				
X	X				
X	X				
X	X				
X	X				
X	X				
X	X				
X	X	X	X	X	X
X	X				
X	X				
X	X	X		X	
		X		X	X
X	X				

Date	Site	8-hour Ozone Value	NC Impact?
5/31/2013	Westport	85	Yes
5/31/2013	E Hartford	77	Yes
5/31/2013	Middletown	82	Yes
5/31/2013	New Haven	84	Yes
5/31/2013	Madison-Beach Road	81	Yes
5/31/2013	Groton Fort Griswold	80	Yes
5/31/2013	Stafford	83	Yes
6/1/2013	Stafford	81	Yes
6/9/2013	BRIS	77	No
6/21/2013	Danbury	76	No
6/21/2013	E Hartford	77	No
6/21/2013	Middletown	82	No
6/21/2013	Stafford	82	No
6/22/2013	Danbury	76	No
6/24/2013	Greenwich	80	No
6/24/2013	Stratford	88	No
6/24/2013	Westport	85	No
6/24/2013	Madison-Beach Road	89	No
6/24/2013	Groton Fort Griswold	86	No
6/25/2013	W Greenwich	83	Yes
6/25/2013	E Providence	76	Yes
6/25/2013	Stratford	91	No
6/25/2013	Westport	87	No
6/25/2013	Middletown	97	No
6/25/2013	New Haven	77	No
6/25/2013	Madison-Beach Road	88	Yes
6/25/2013	Groton Fort Griswold	90	Yes
6/26/2013	Fair Hill	76	Yes
6/26/2013	BRIS	76	No
7/6/2013	Stratford	76	Yes
7/7/2013	Stratford	77	Yes
7/7/2013	Westport	81	Yes
7/8/2013	Stratford	81	No
7/8/2013	Westport	80	No
7/8/2013	Madison-Beach Road	77	Yes
7/9/2013	Greenwich	78	No

Trajectory Heights					
10	100	500	1000	1500	2000
X	X				
			X	X	X
X	X			X	X
X	X				X
X	X				
X	X				
			X	X	X
X	X	X	X	X	X
X					
X					
X					
X					
X					
X	X	X	X		X
X	X	X	X	X	X
X	X	X	X	X	X
X					



Date	Site	8-hour Ozone Value	NC Impact?	Trajectory Heights						
				10	100	500	1000	1500	2000	
5/27/2014	Stratford	84	No							
5/27/2014	Westport	76	No							
5/27/2014	Middletown	86	No							
6/2/2014	E Hartford	77	No							
6/2/2014	Stafford	81	No							
6/16/2014	NEA	84	No							
6/17/2014	Edgewood	80	No							
6/17/2014	Wagner	78	No							
6/17/2014	Greenwich	83	No							
6/17/2014	Danbury	84	No							
6/17/2014	Stratford	76	No							
6/17/2014	Westport	84	No							
6/17/2014	E Hartford	77	No							
6/17/2014	Middletown	77	No							
6/17/2014	New Haven	78	No							
6/17/2014	Stafford	77	No							
7/7/2014	Wagner	83	Yes	X	X					
7/7/2014	Greenwich	91	Yes			X				
7/7/2014	Westport	81	Yes			X				
7/7/2014	E Hartford	83	Yes			X				
7/7/2014	Middletown	78	Yes			X				
7/7/2014	Stafford	82	Yes			X				
7/8/2014	Greenwich	78	Yes	X	X					
7/8/2014	Westport	82	Yes	X	X					
7/8/2014	E Hartford	77	Yes	X	X					
7/8/2014	Middletown	82	Yes	X	X					
7/8/2014	New Haven	76	Yes	X	X					
7/8/2014	Stafford	77	Yes	X	X					
7/11/2014	Fair Hill	79	No							
7/11/2014	Edgewood	78	No							
7/12/2014	Harrison Township	76	No							
7/22/2014	Stratford	78	No							
7/22/2014	Westport	80	No							
7/22/2014	Middletown	82	No							
7/22/2014	Stafford	77	No							
8/4/2014	Harrison Township	76	No							





## **Attachment D2**

**Trajectories and Other Data on Ozone Exceedance Days for select  
Northeastern U.S. ozone monitor sites from 2011 to June 15, 2015**

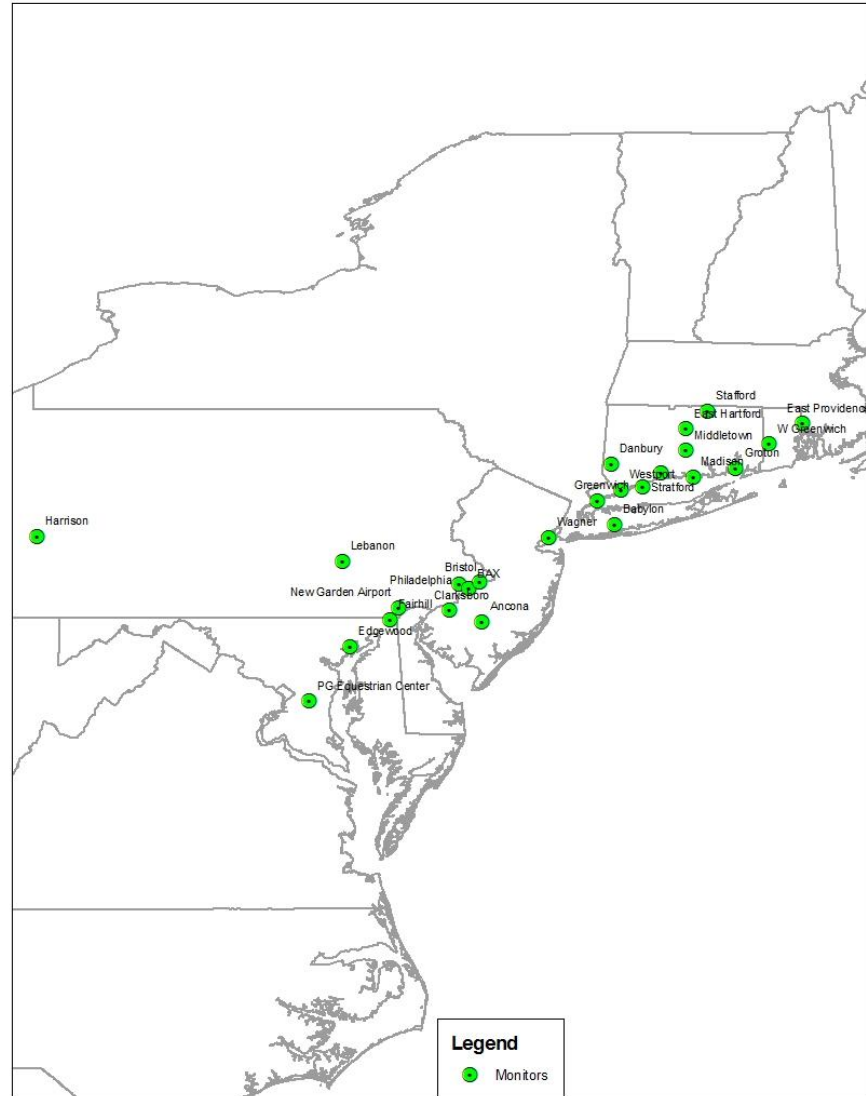
# Background

- As part of the North Carolina Division of Air Quality (NCDAQ)'s Good Neighbor Infrastructure SIP, the NCDAQ has produced information based on data from OTC ozone monitor sites on days in which they exceeded the current 75 PPB standard. This information is an attempt to demonstrate that interstate transport of ozone and/or ozone precursors from North Carolina does not produce significant effects on ozone values observed in OTC, consistent with EPA Transport Rule modeling released recently.

# Back Trajectory Exercise

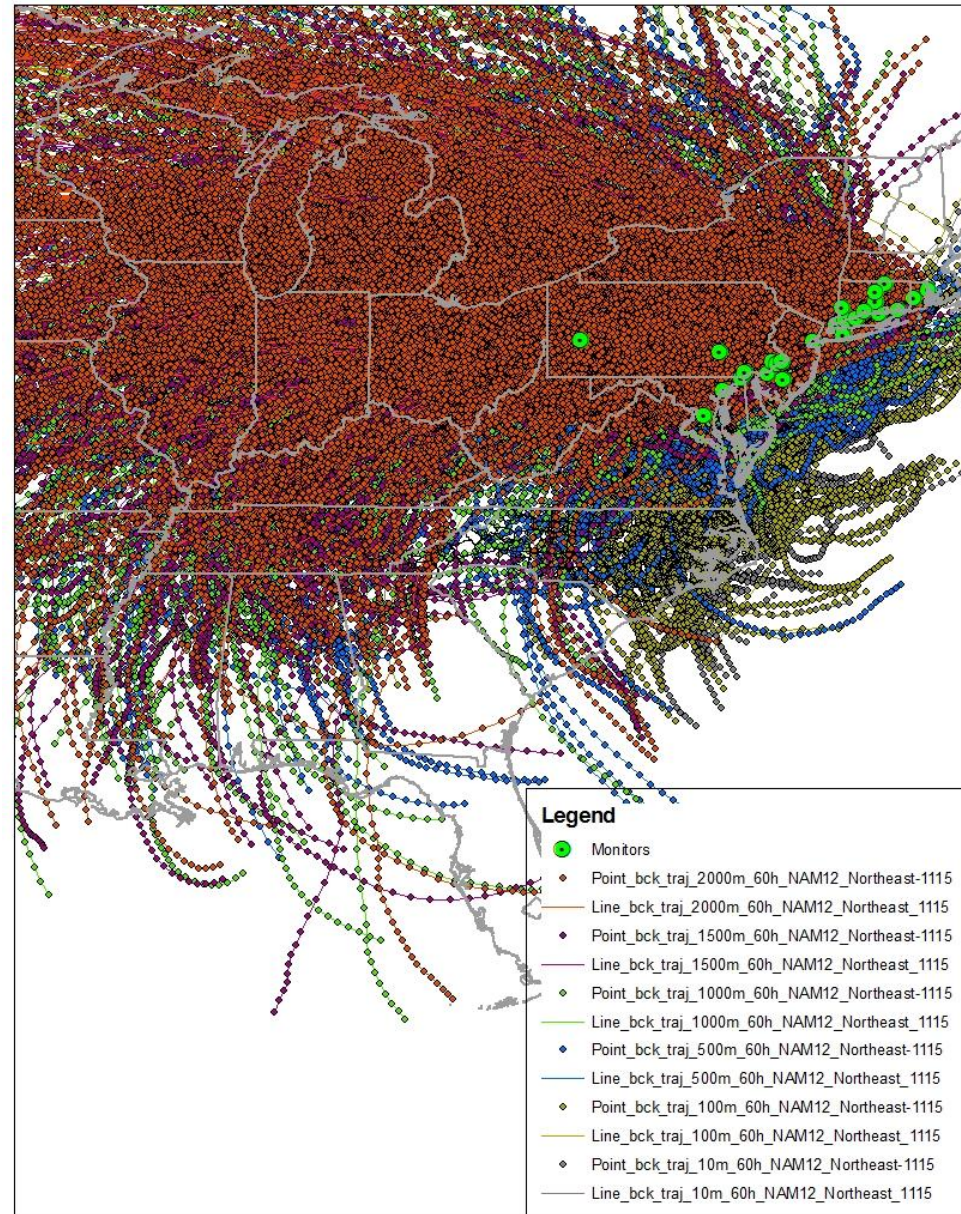
- Back trajectories end at heights of 10m, 100m, 500m, 1000m, 1500m, and 2000m AGL at the lat/lon of OTC ozone monitor sites.
- Back trajectories end at 20Z (4PM EDT or 3PM EST) on the day the exceedance occurred.
- Back trajectories were conducted only for monitors in which an exceedance was measured on a given day.
- Back trajectories go back in time 60 hours.
- Used NAM 12km data, running HYSPLIT trajectory model.
- Attempted to analyze daily ozone values at upwind sites in VA/NC on prior days where trajectories passes over or very near to a given site.
  - Utilized monitor sites in which a given trajectory passed near/over the monitor site between 17Z-23Z, in order to capture the period of highest diurnal ozone concentration.
- Used 2011 to 6/15/2015 data to produce list of exceedance days and sites.

# OTC sites



# All back trajectories

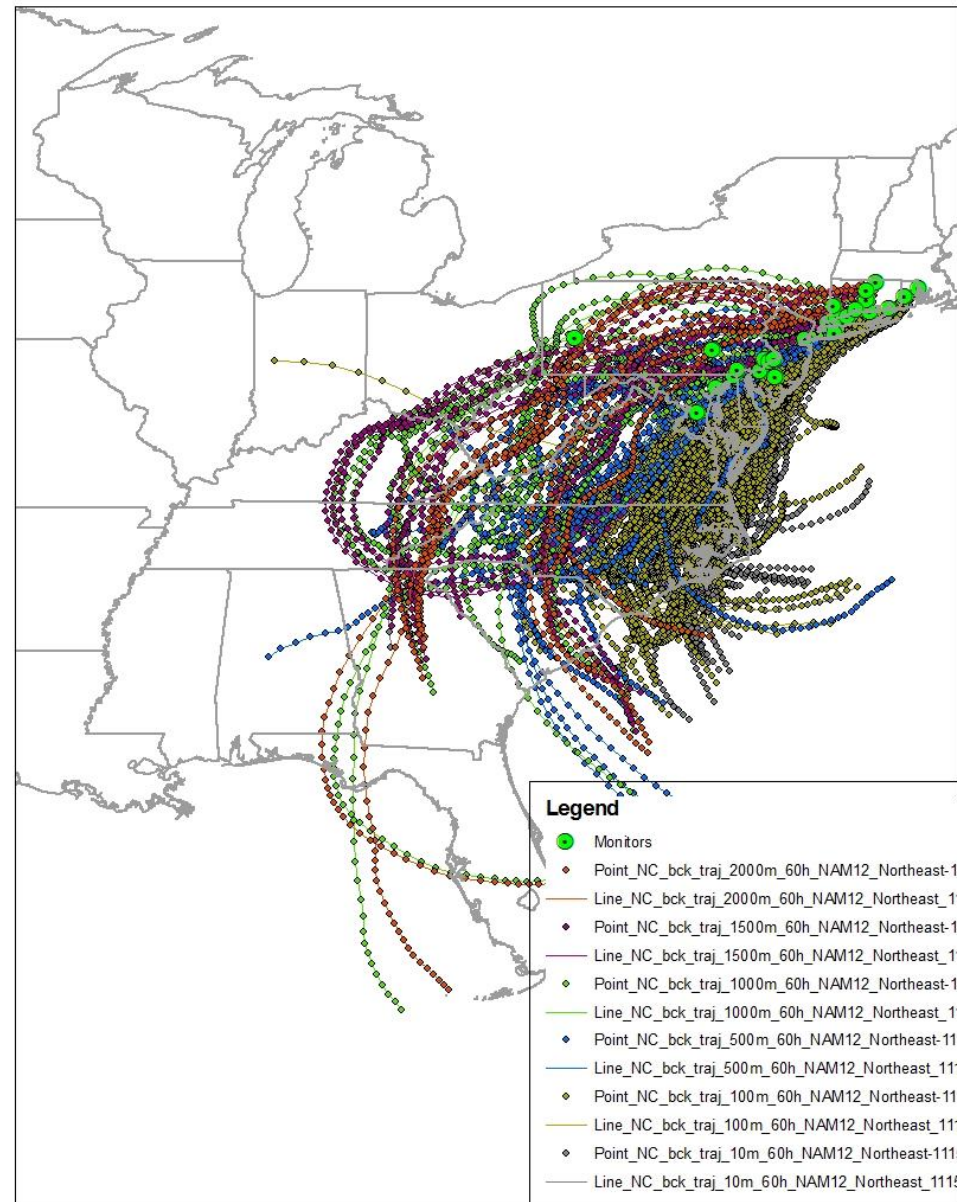
- A total of 103 days were identified where one or more ozone exceedances occurred within the OTA between 2011 to 6/15/2015.
- A total of 552 trajectories were produced for each studied level from this set of days and exceeding monitors.





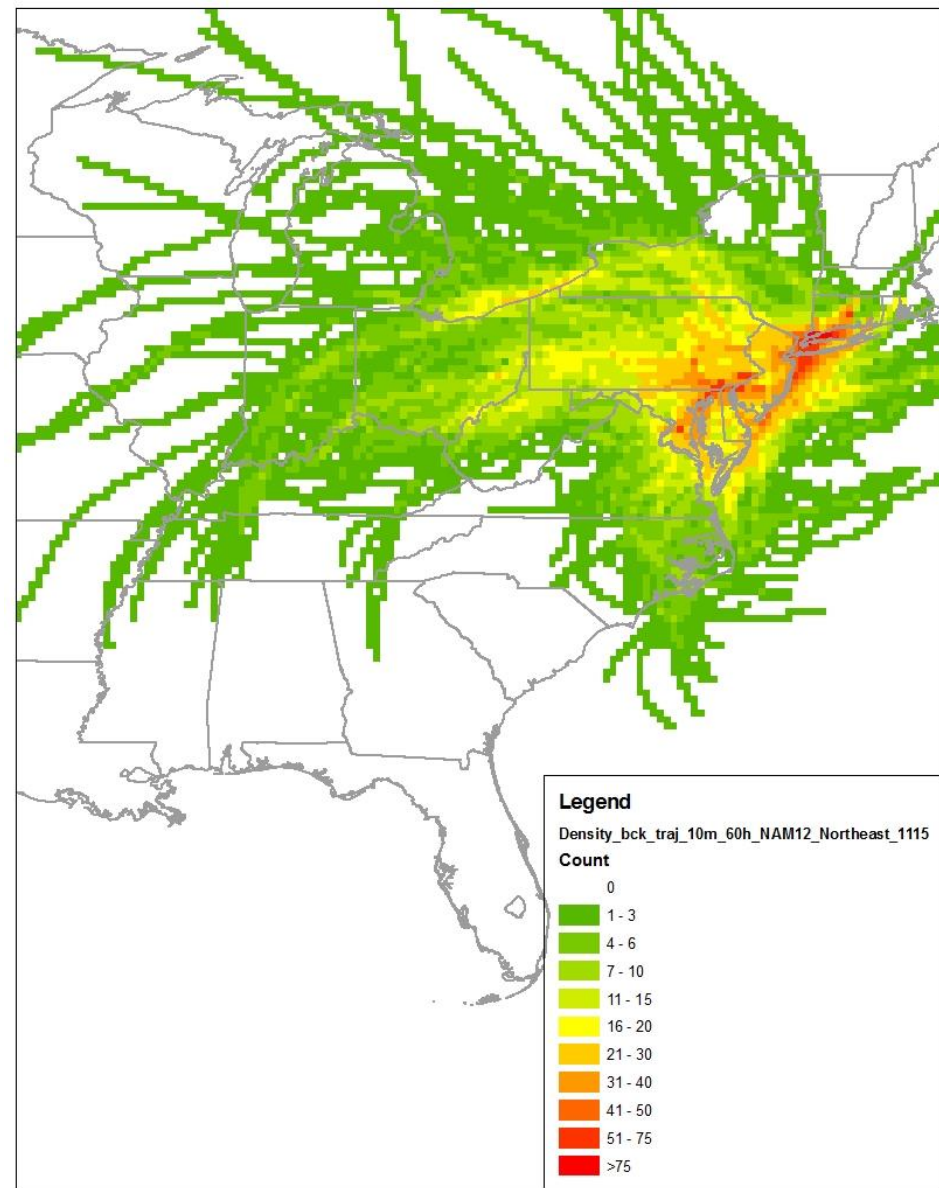
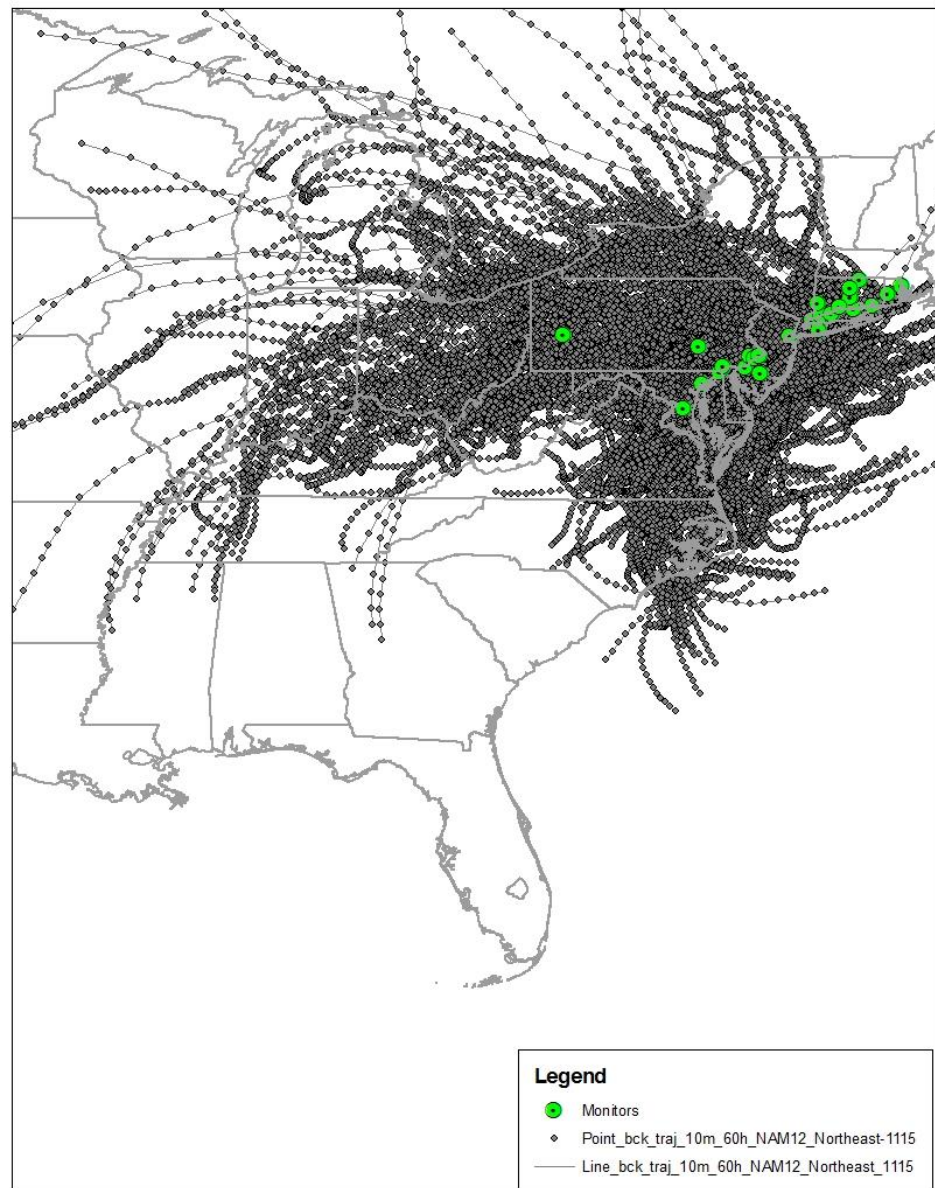
# NC trajectories

- Only a few of these trajectories crossed into North Carolina territory.
  - 2000m: 11
  - 1500m: 14
  - 1000m: 17
  - 500m: 24
  - 100m: 61
  - 10m: 65
- Only the days where trajectories crossed from North Carolina to the Northeast (29 total) are analyzed in the proceeding slides.



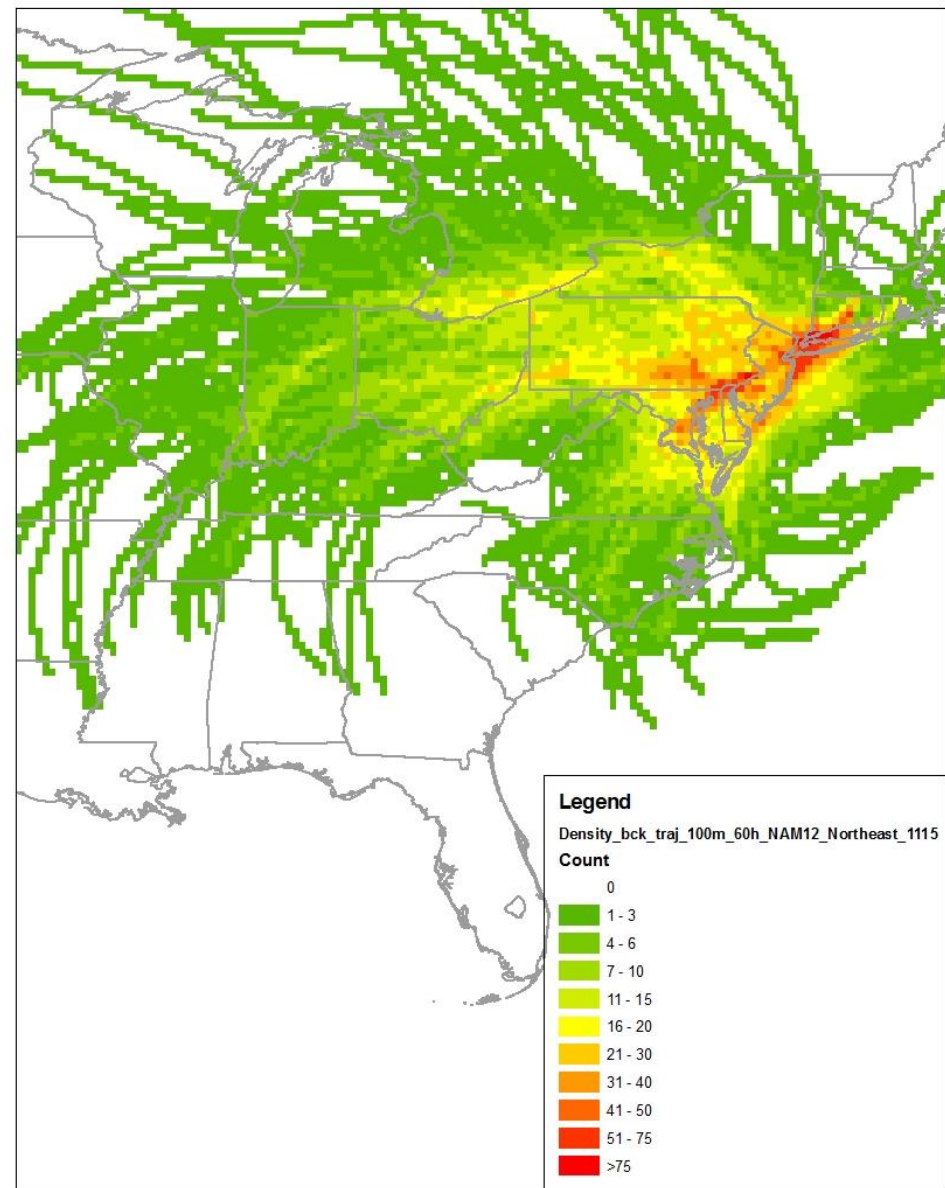
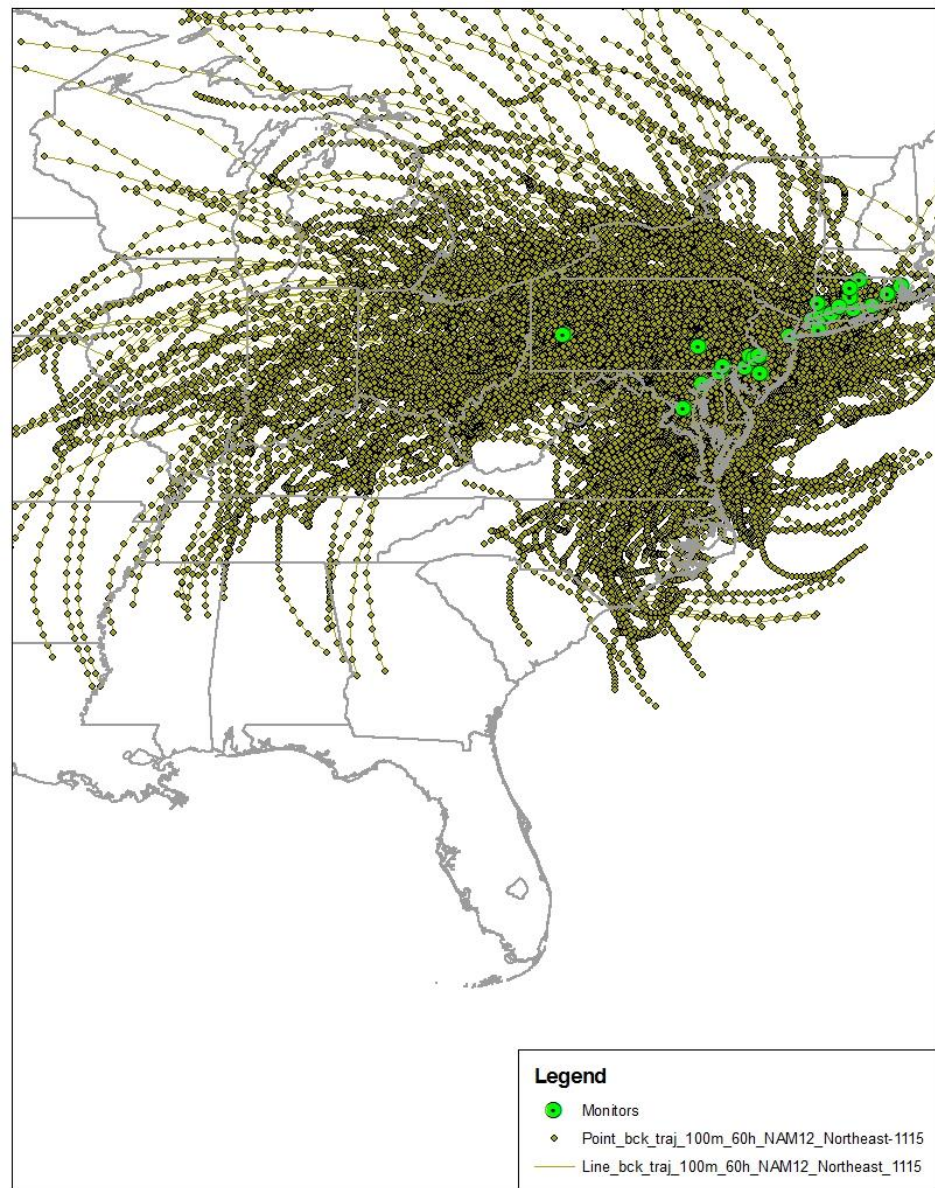
# All 10m back trajectories

## 2011-6/15/2015





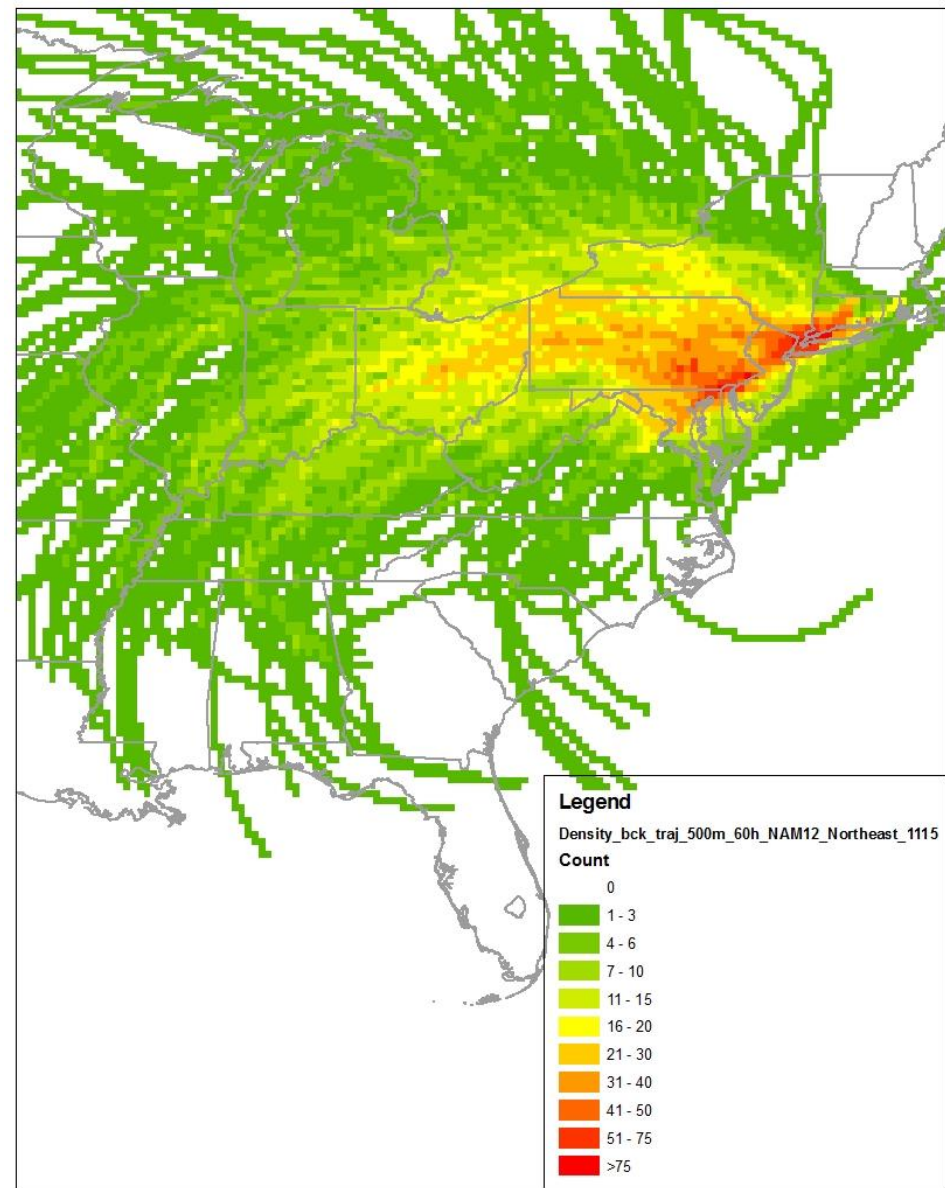
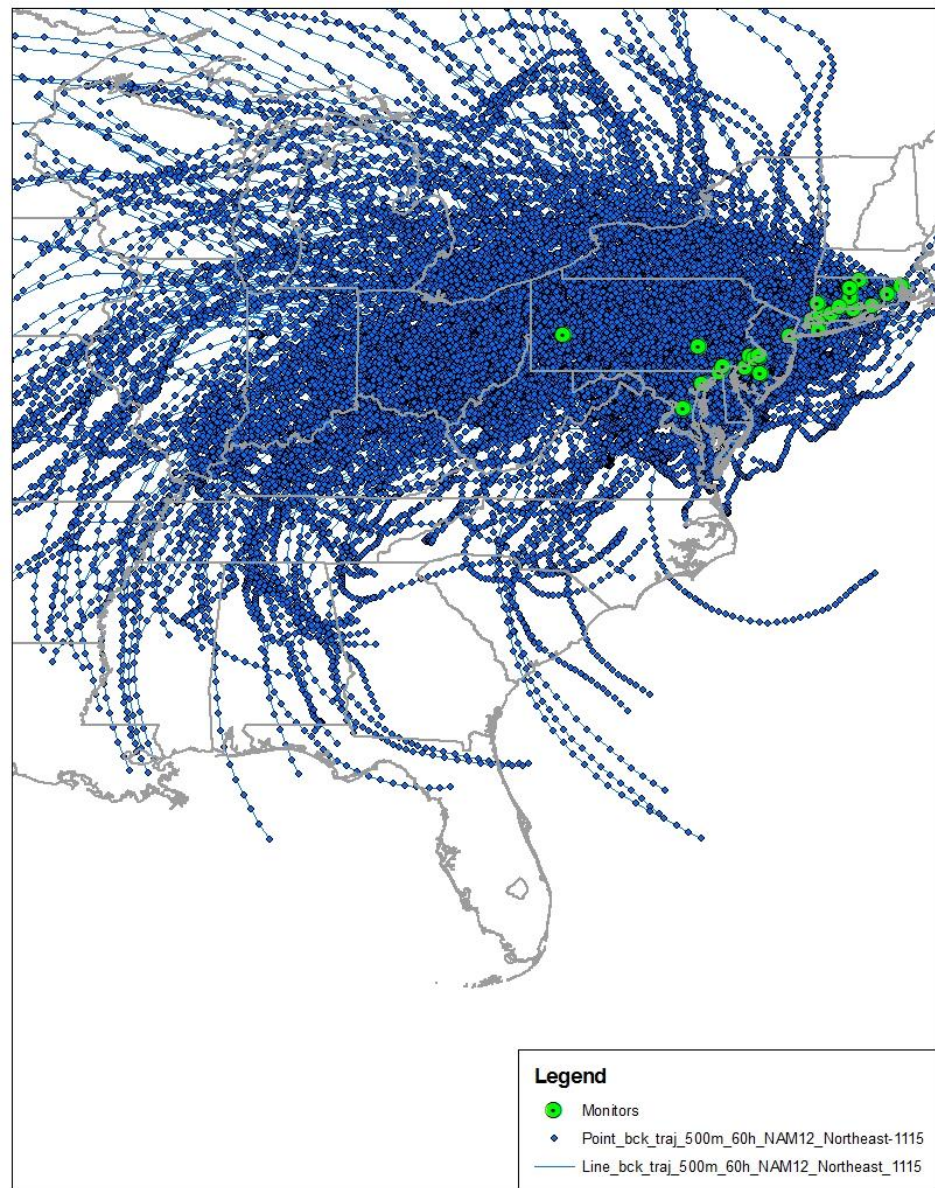
# All 100m back trajectories 2011-6/15/2015





# All 500m back trajectories

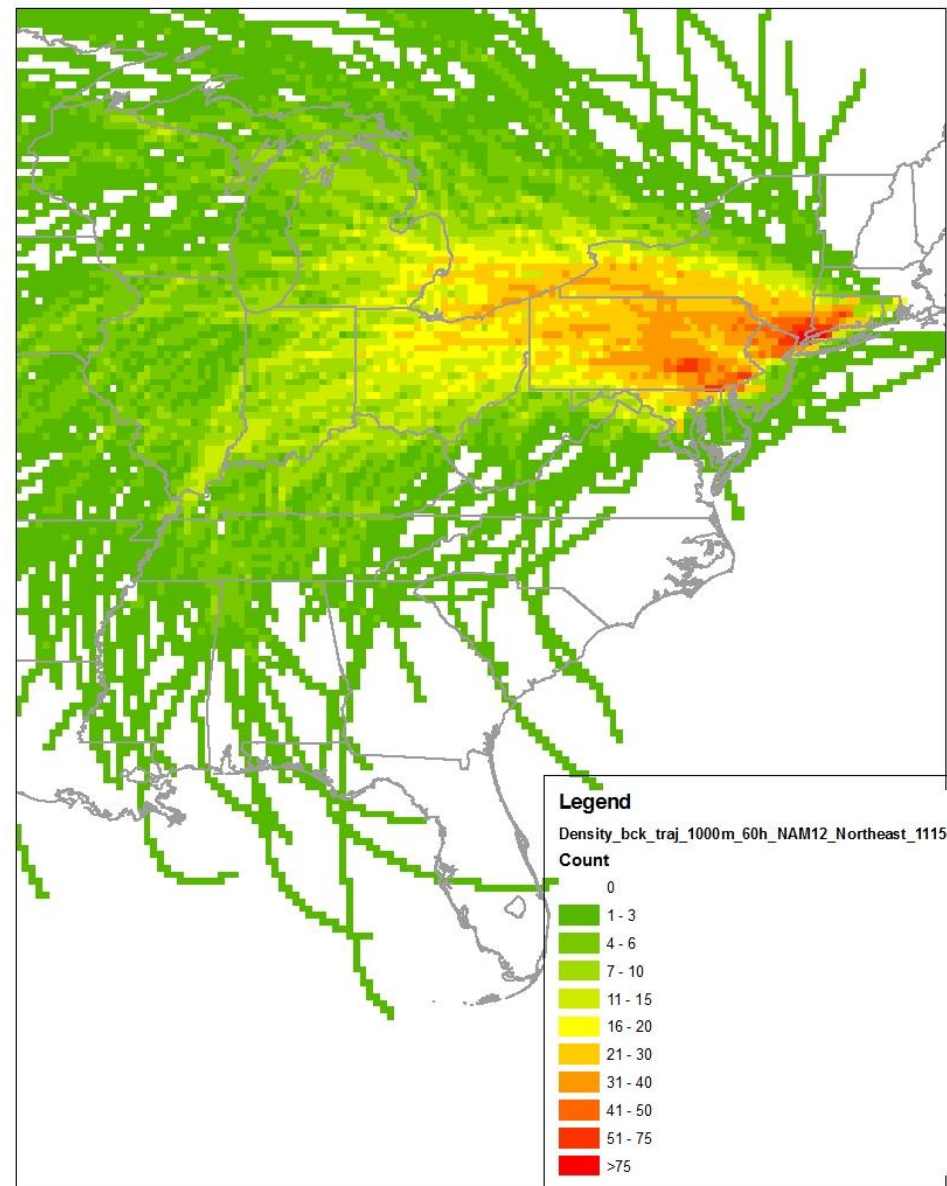
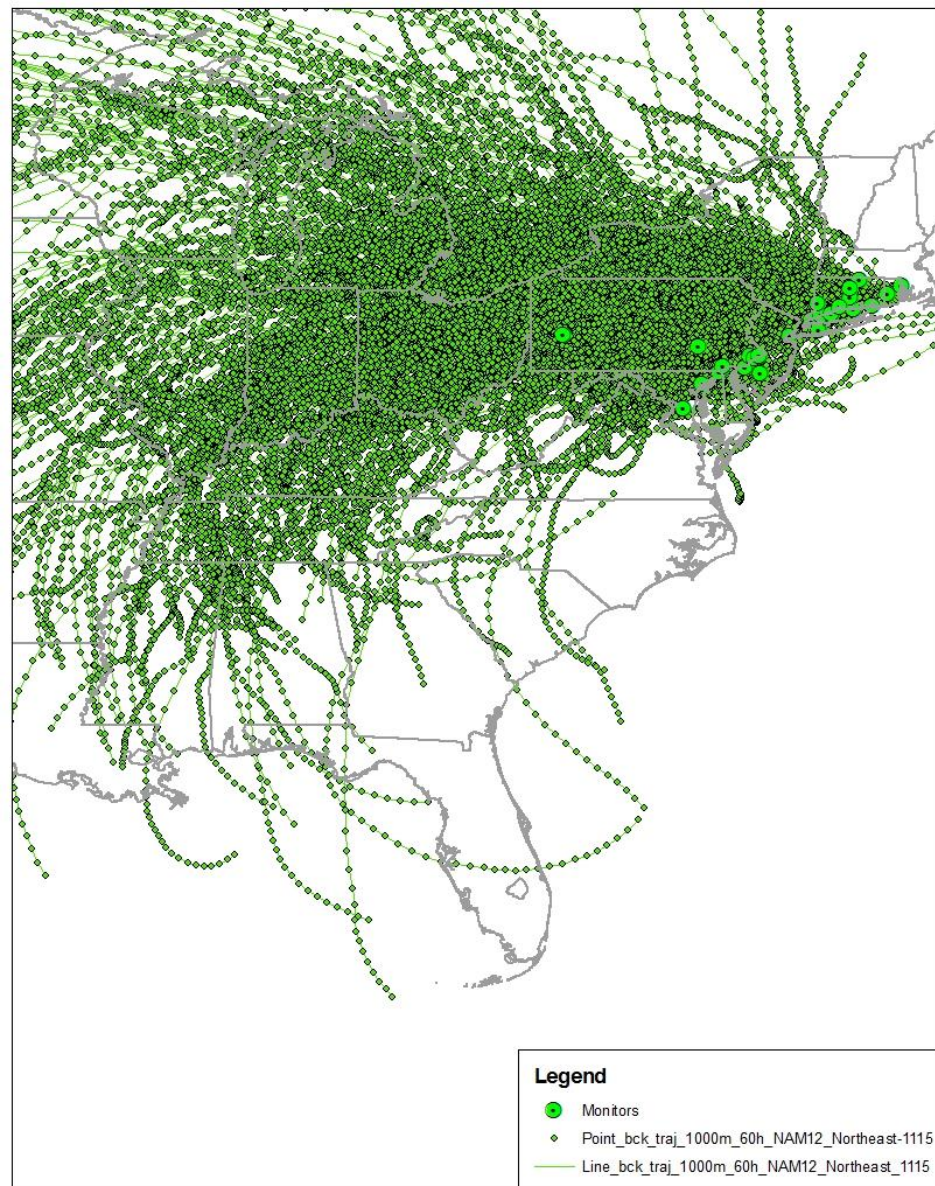
## 2011-6/15/2015





# All 1000m back trajectories

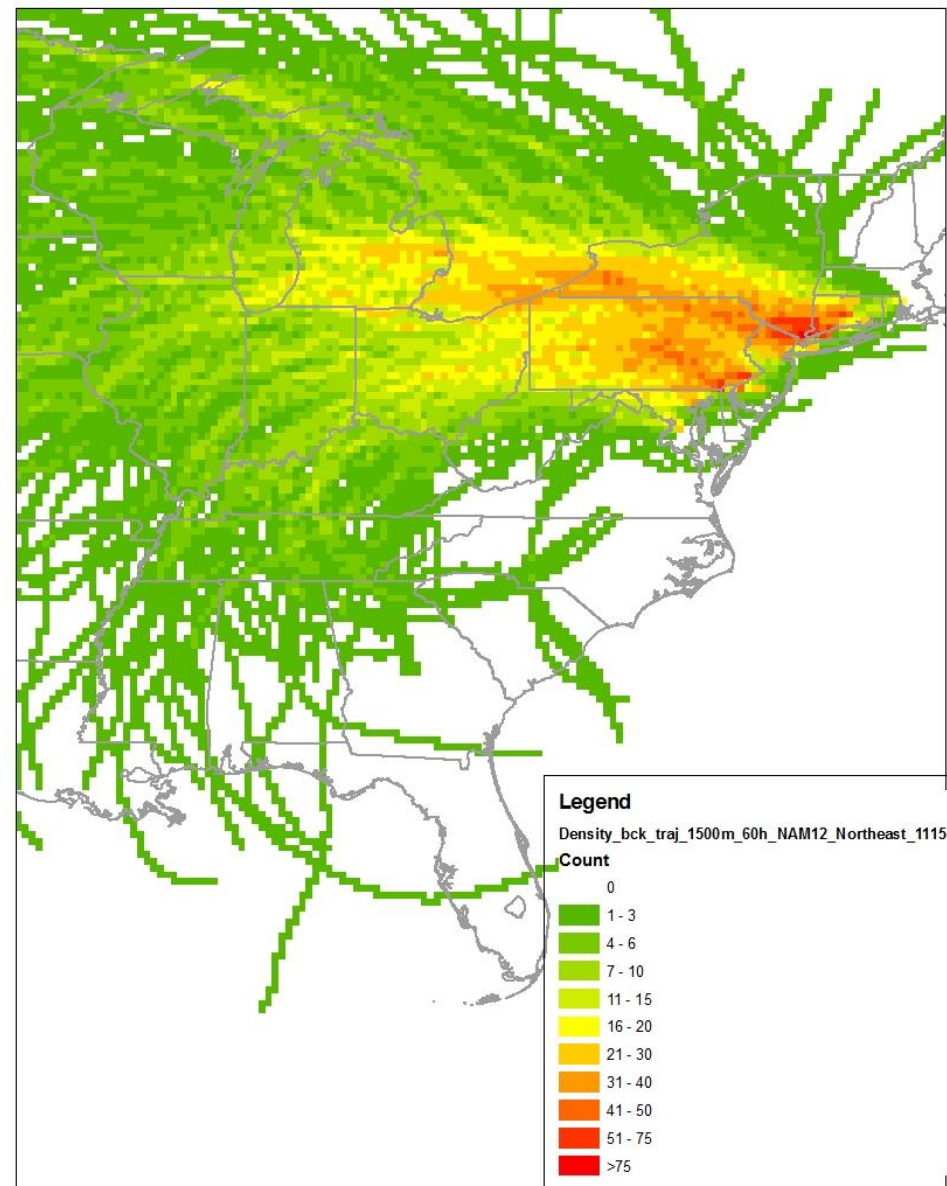
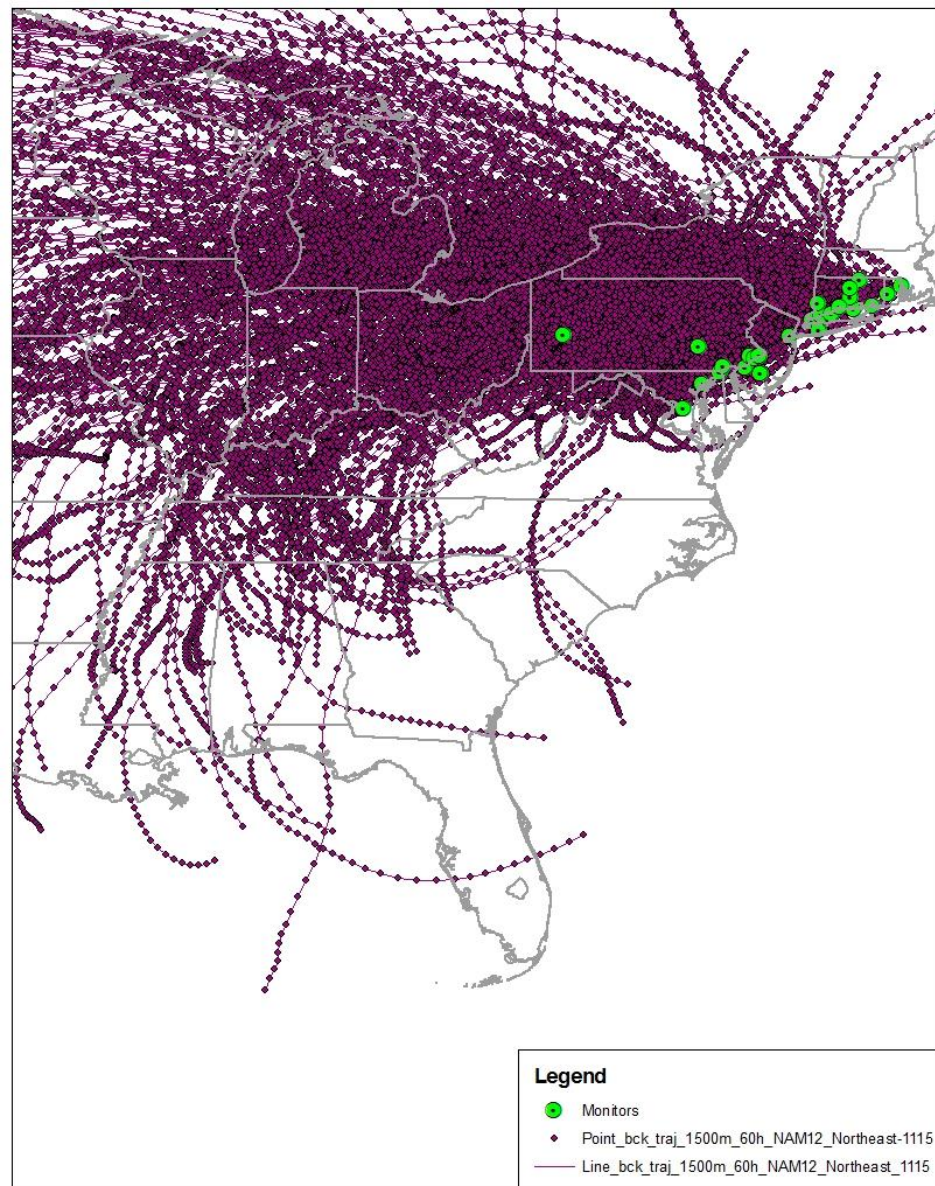
## 2011-6/15/2015





# All 1500m back trajectories

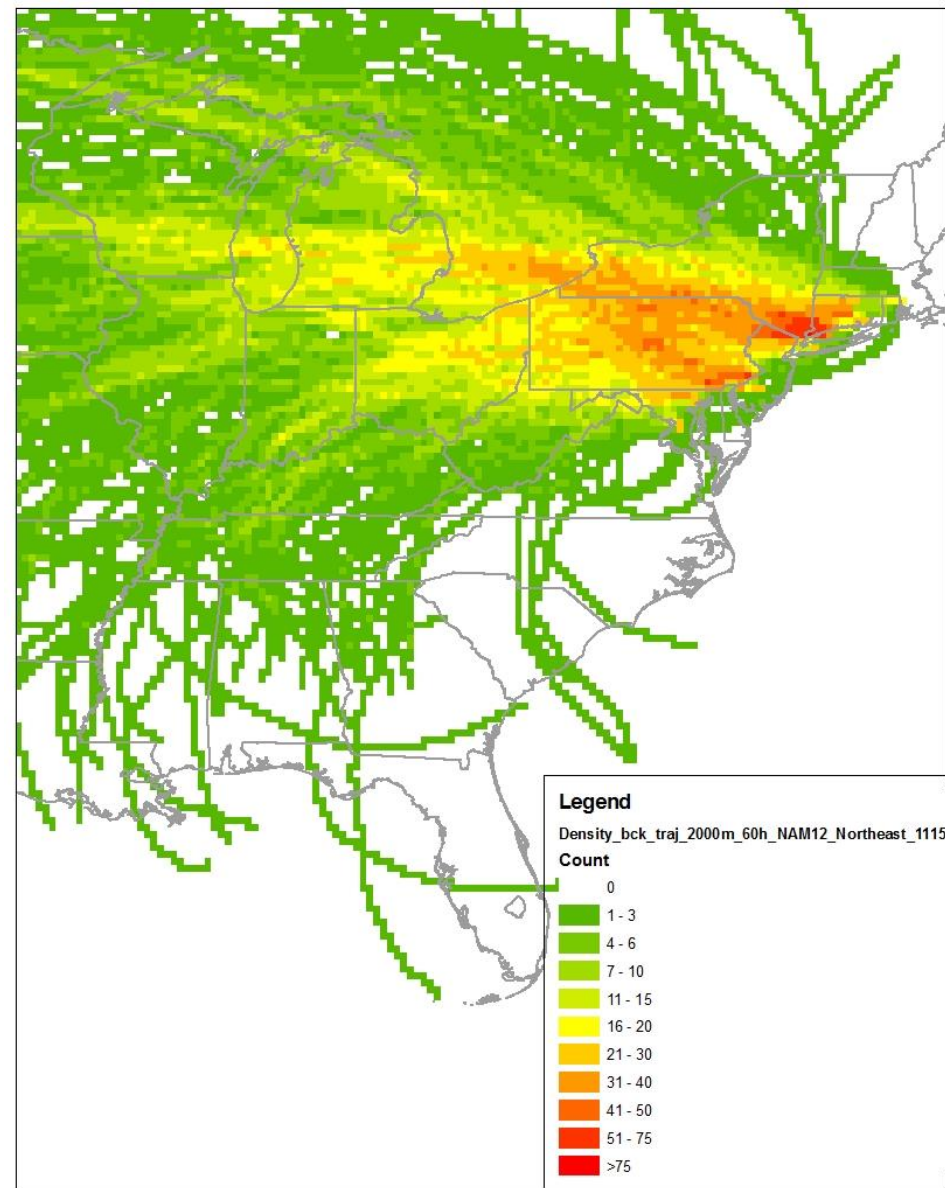
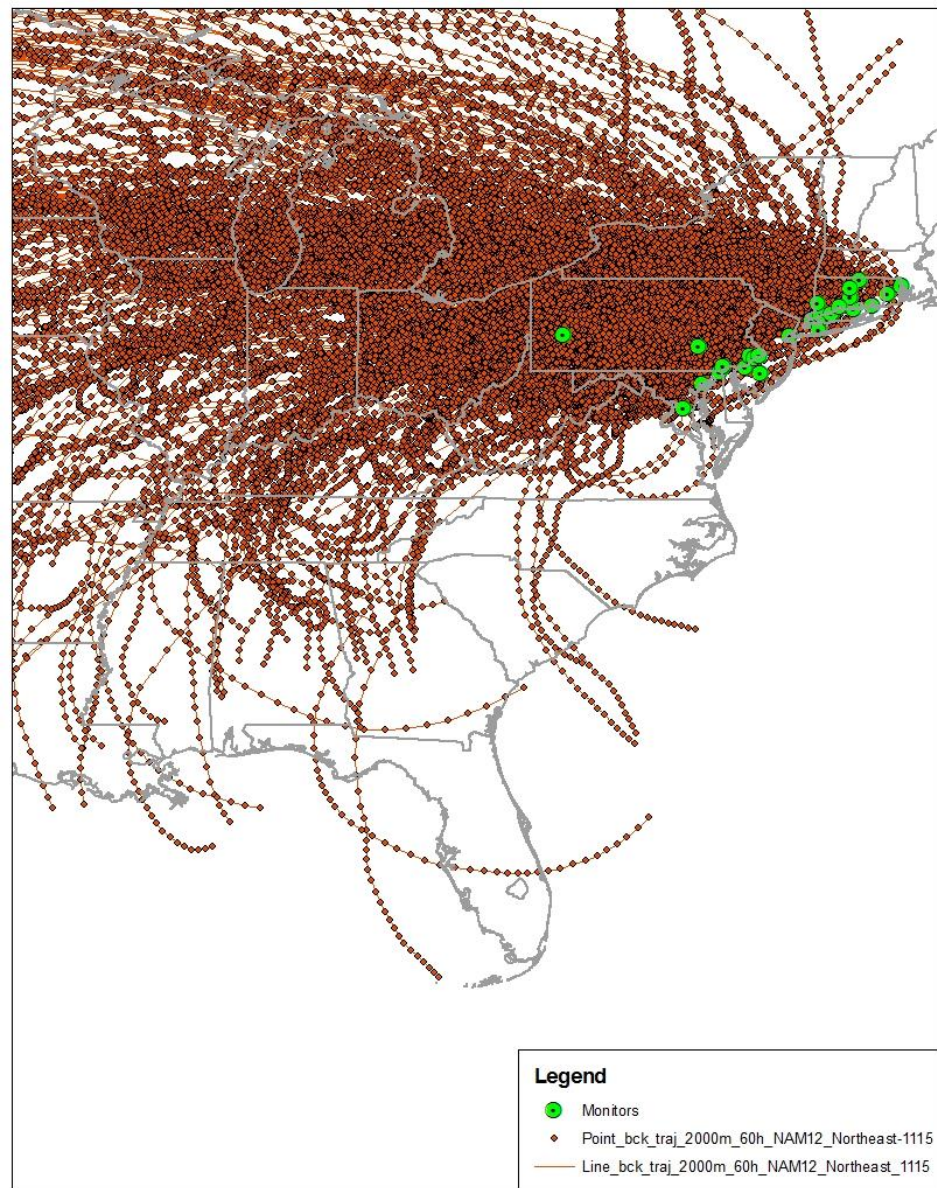
## 2011-6/15/2015





# All 2000m back trajectories

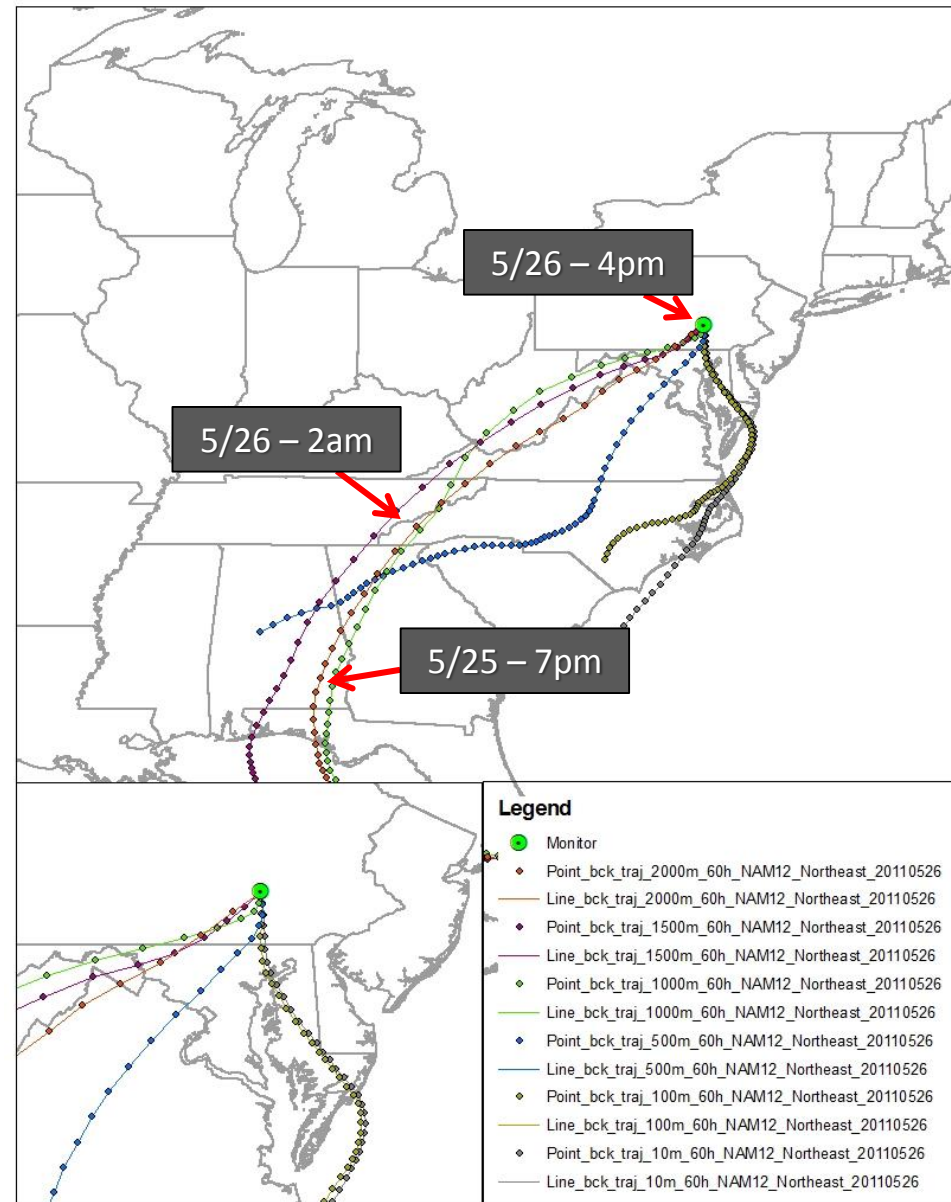
## 2011-6/15/2015



# 5/26/2011

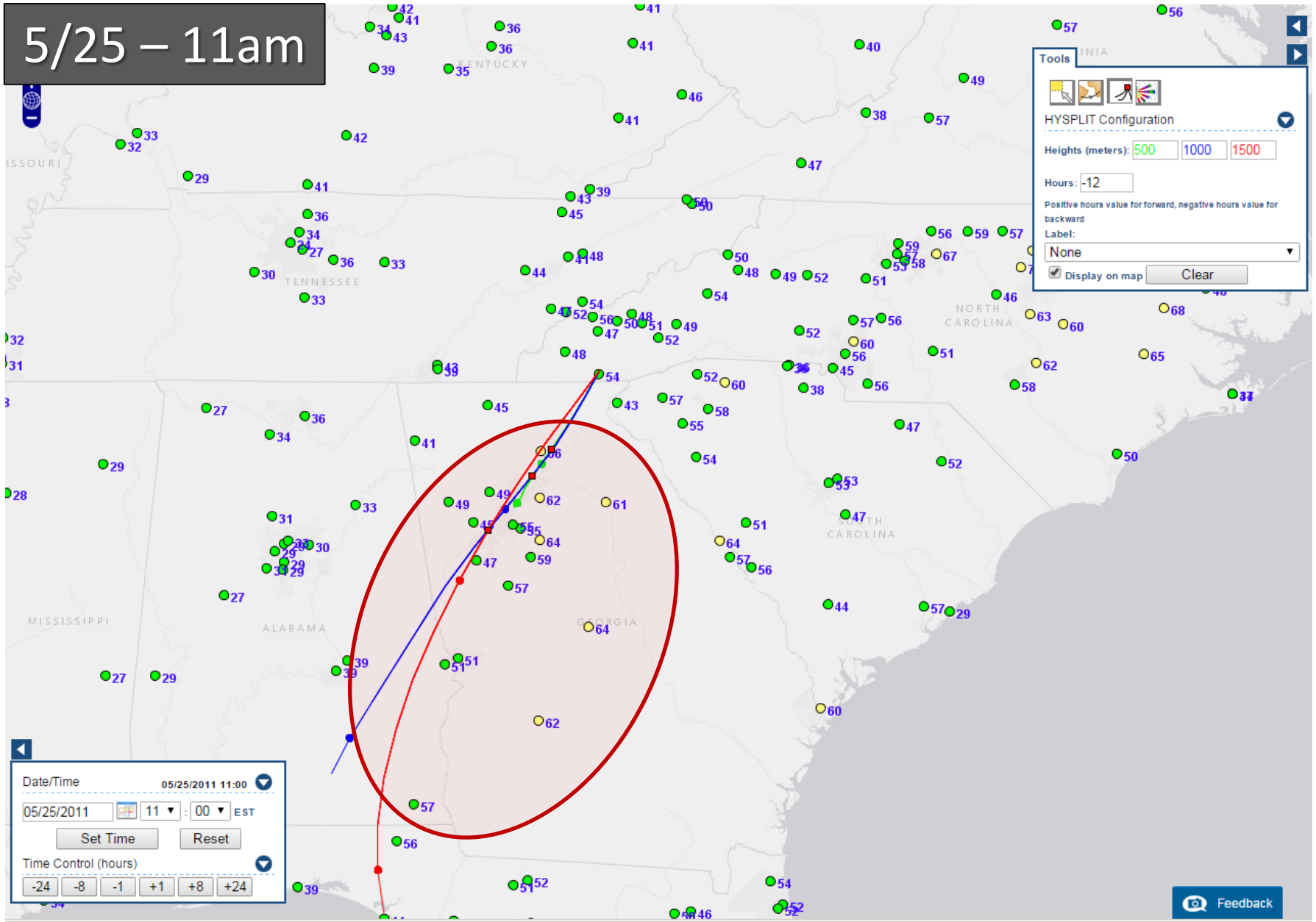
Slide 12

- Exceeding Monitor:
  - Lebanon PA: 77 PPB
- Elevated ozone advected NNW from GA
  - Moved into Asheville valleys/Ridge Top monitors during afternoon of 5/25
- Shenandoah NP, VA (high elevation) ozone monitor elevated 5/25 into 5/26
- 100m trajectory across NC Coastal Plain 5/24
  - Jamesville NC: 61 PPB.
- Ozone aloft combined with low level flow from DC/Baltimore corridor on 5/26 in Lebanon to produce exceedance



# 5/26/2011

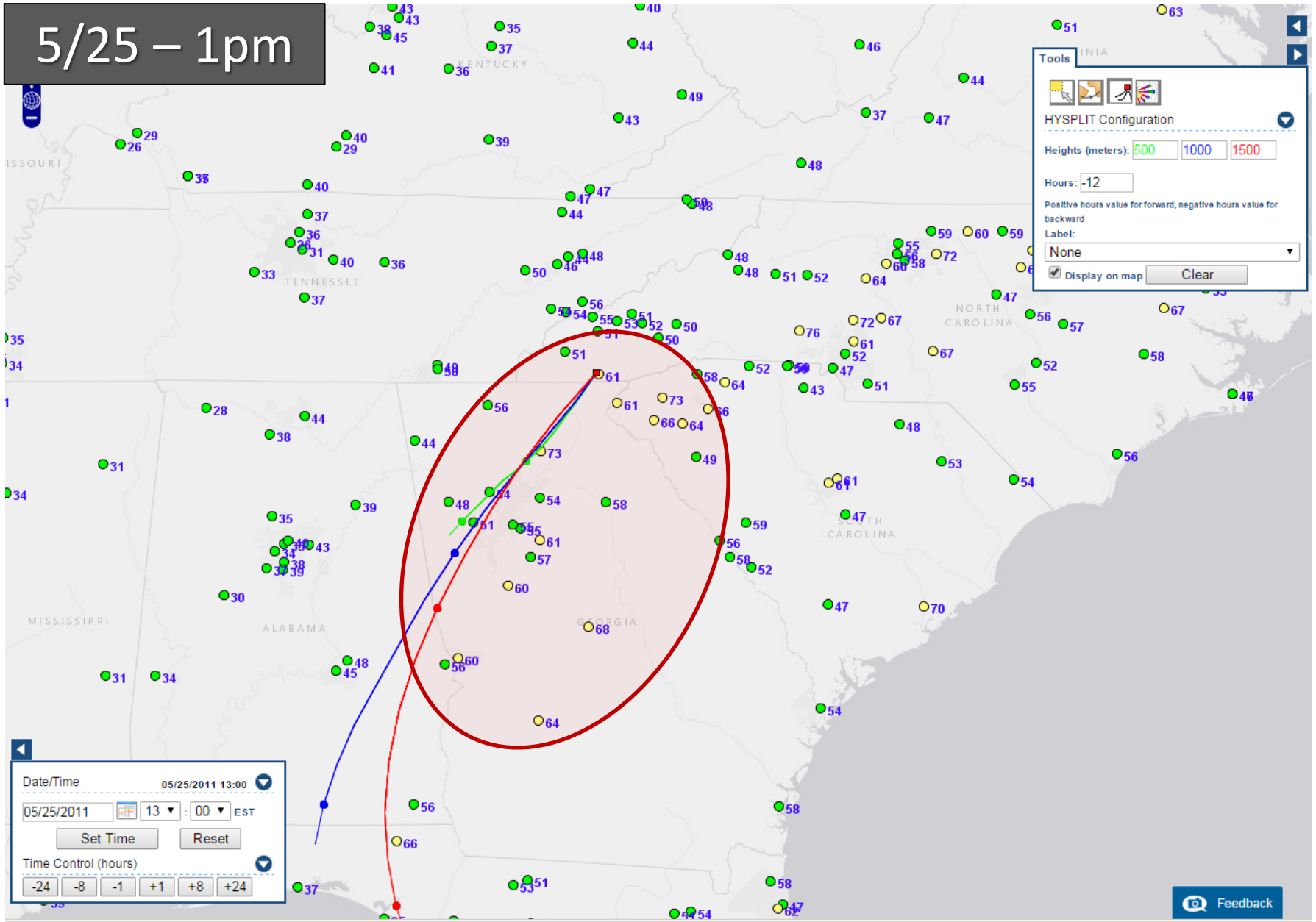
5/25 – 11am





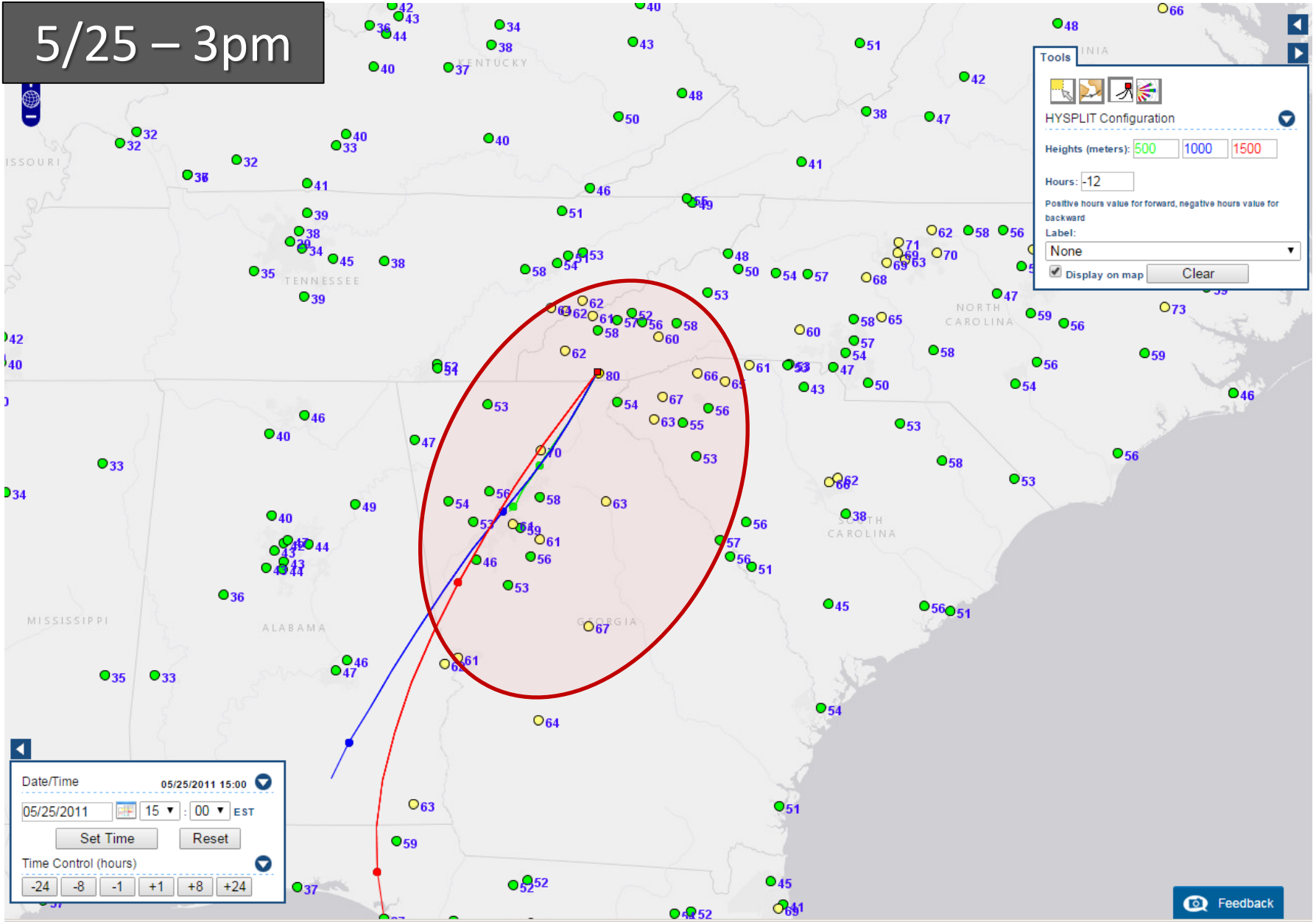
# 5/26/2011

5/25 – 1pm



# 5/26/2011

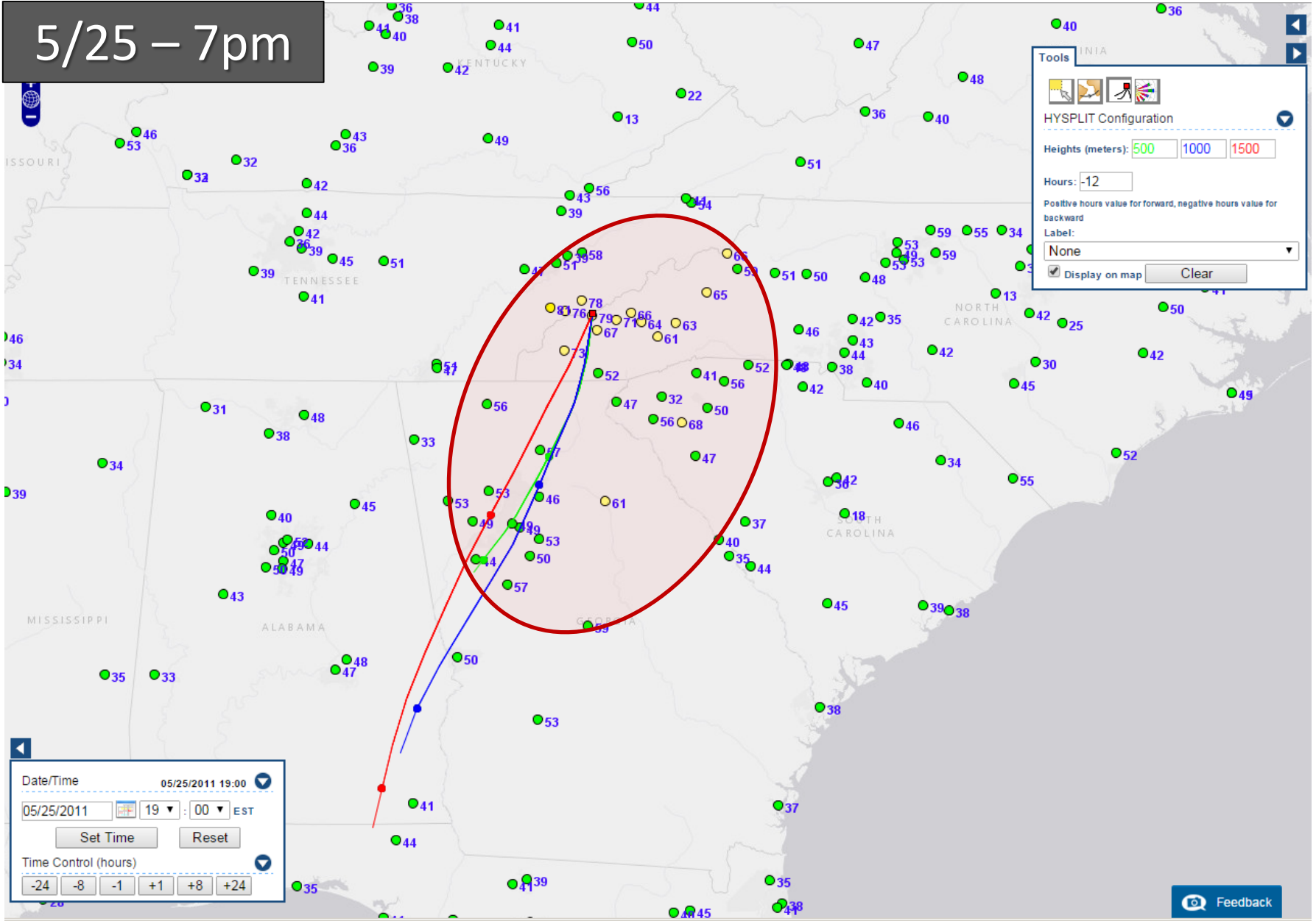
5/25 – 3pm



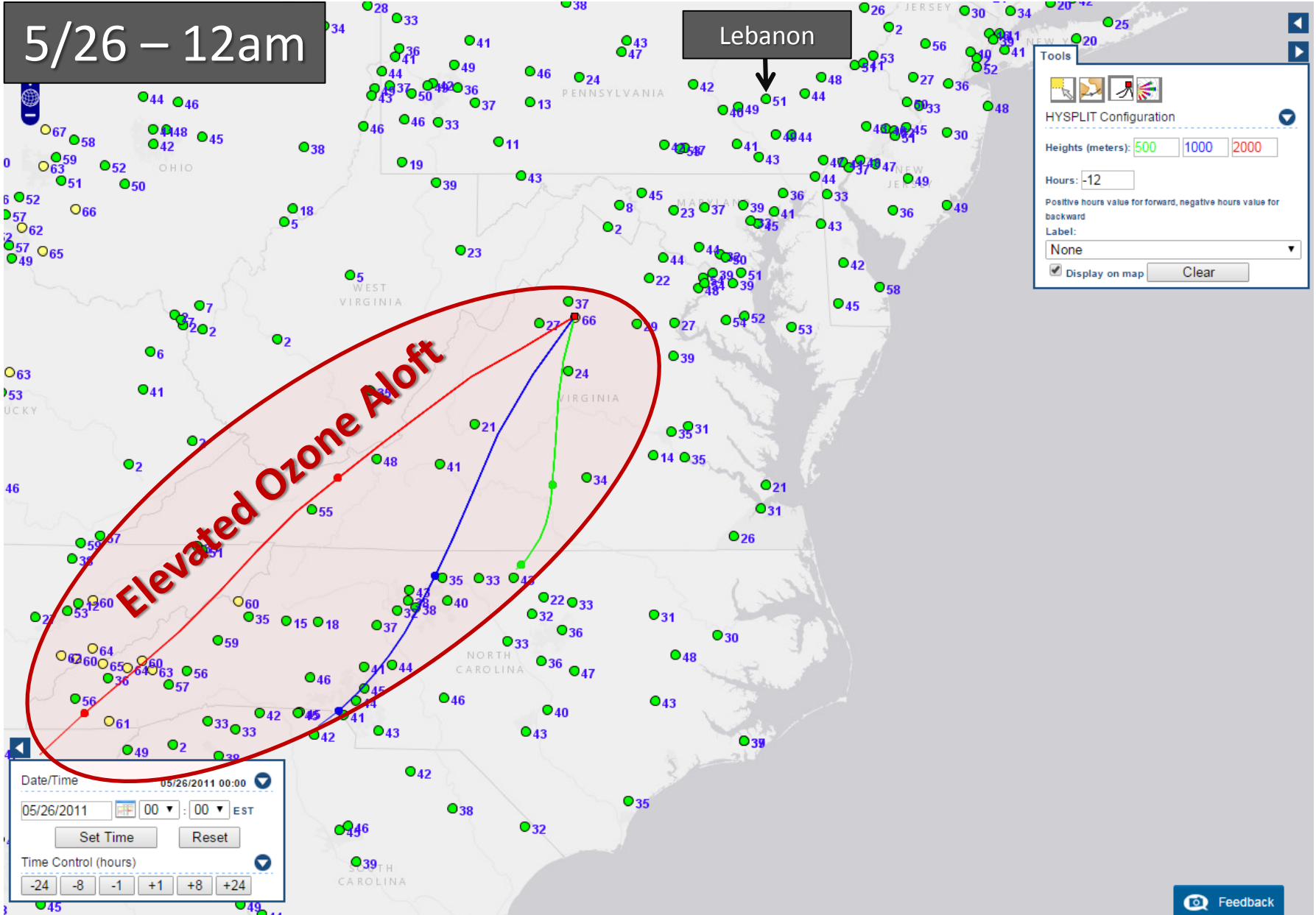


# 5/26/2011

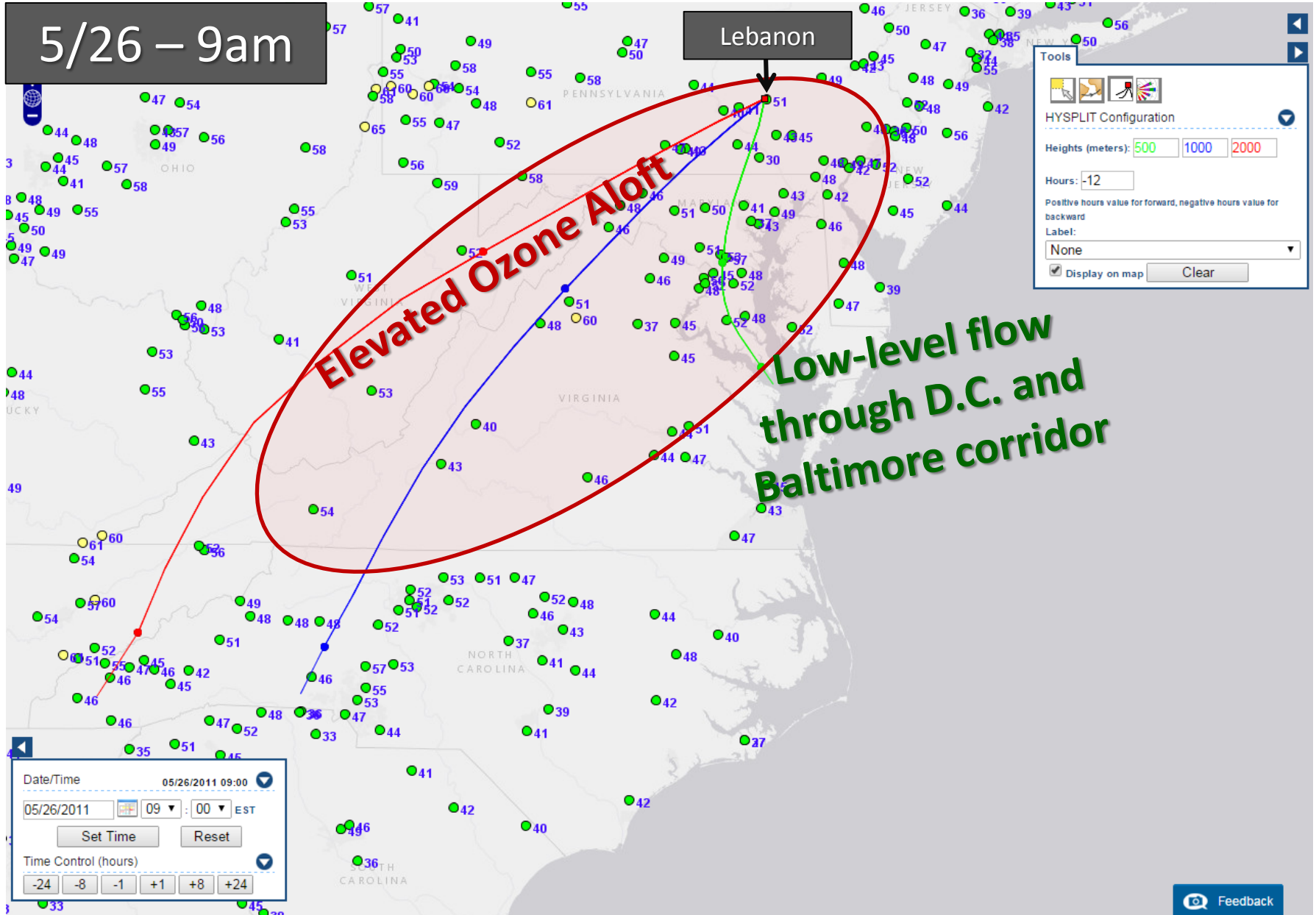
5/25 – 7pm



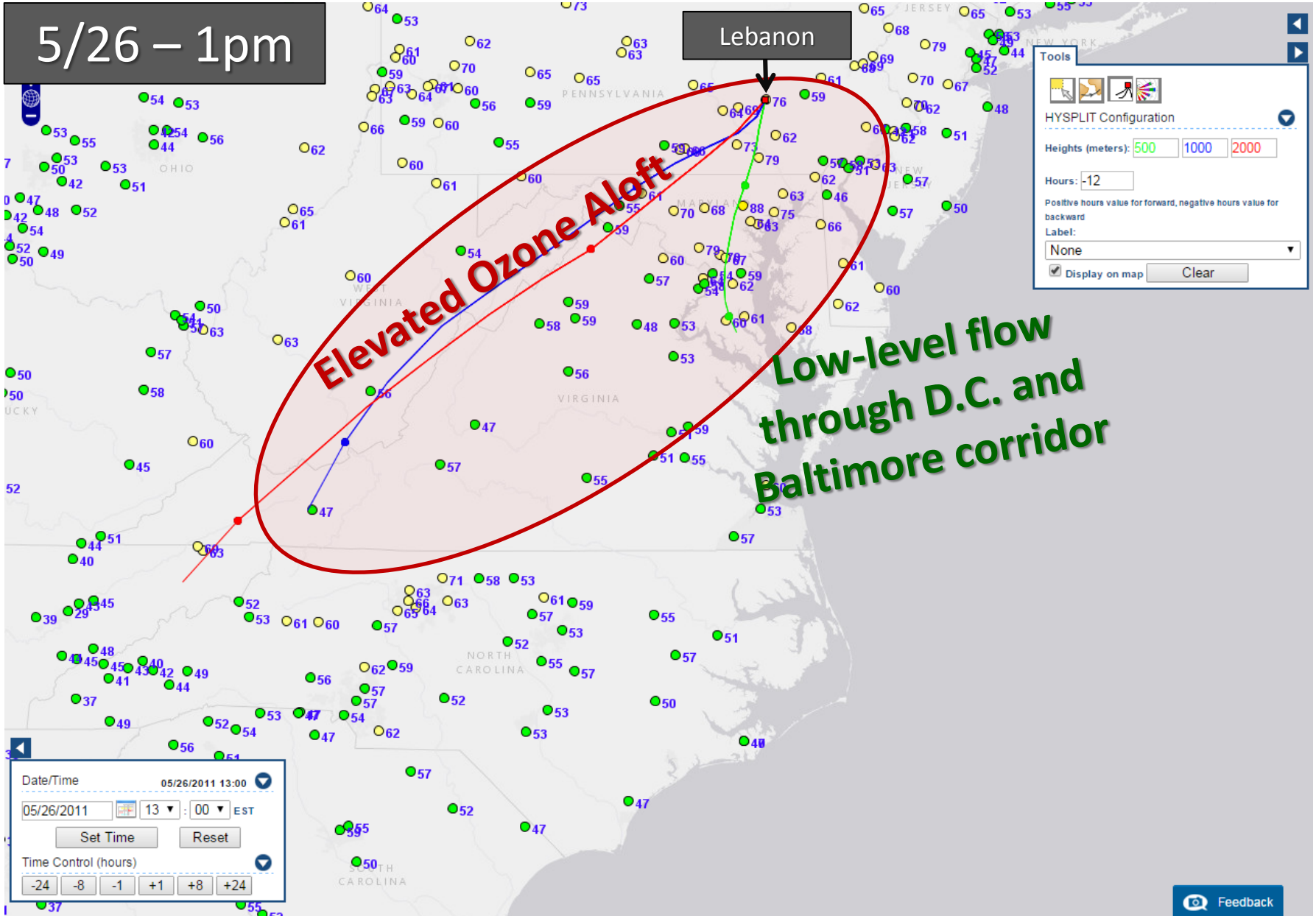
# 5/26/2011



# 5/26/2011



# 5/26/2011

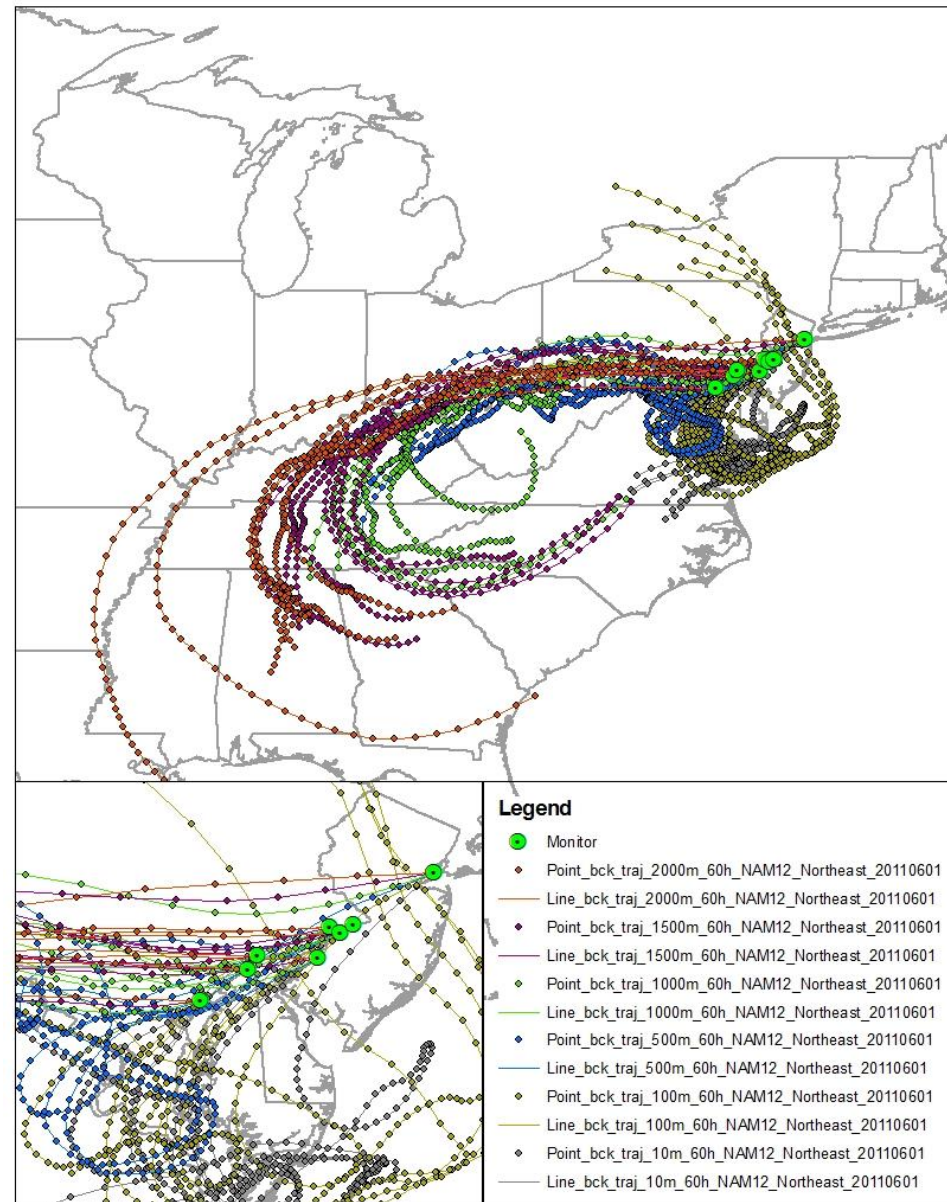




# 6/1/2011

Slide 20

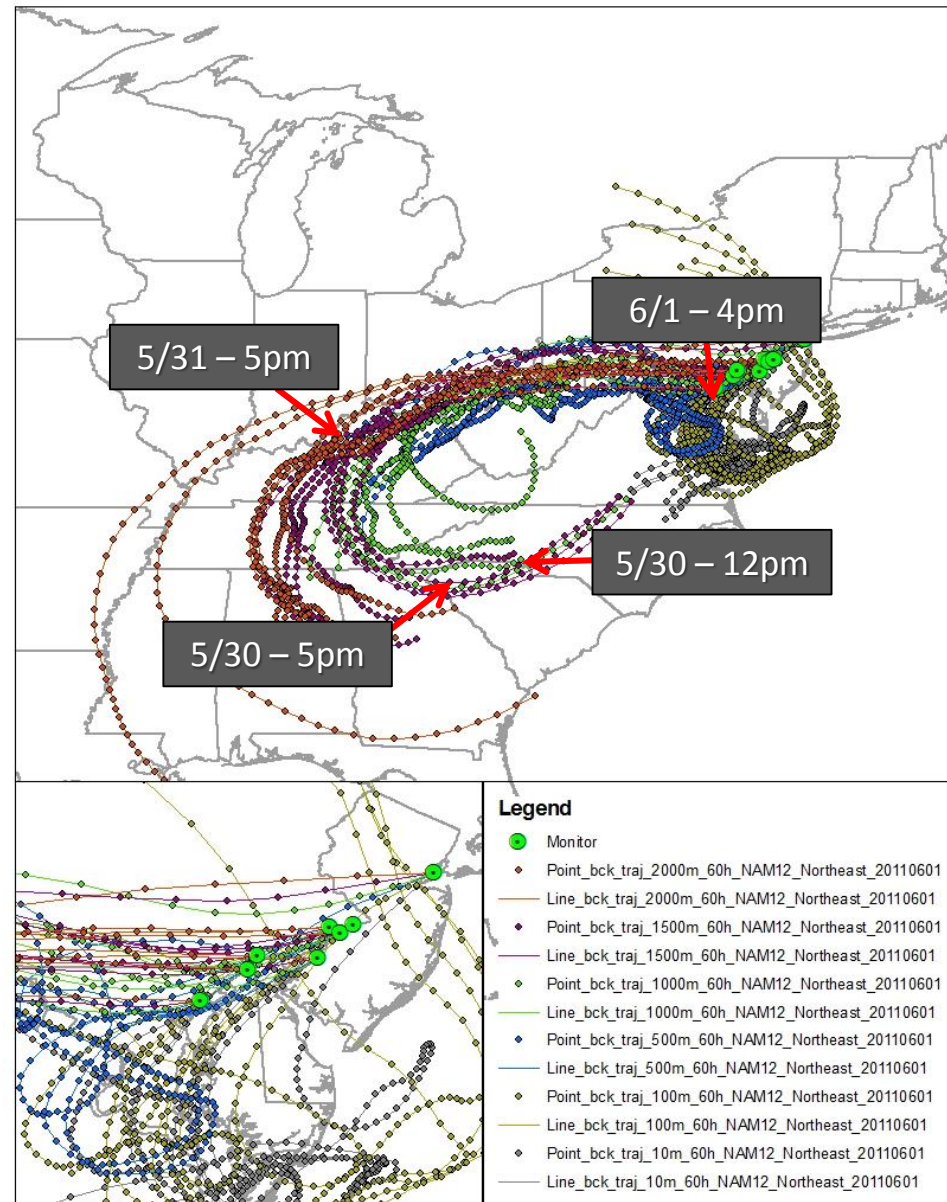
- Exceeding monitors:
  - Philadelphia (NEA): 94 PPB
  - Philadelphia (BAX): 89 PPB
  - Fair Hill MD: 92 PPB
  - Wagner NY: 89 PPB
  - Bristol PA: 85 PPB
  - Clarksboro NJ: 83 PPB
  - Edgewood MD: 79 PPB
  - Newgarden PA: 78 PPB



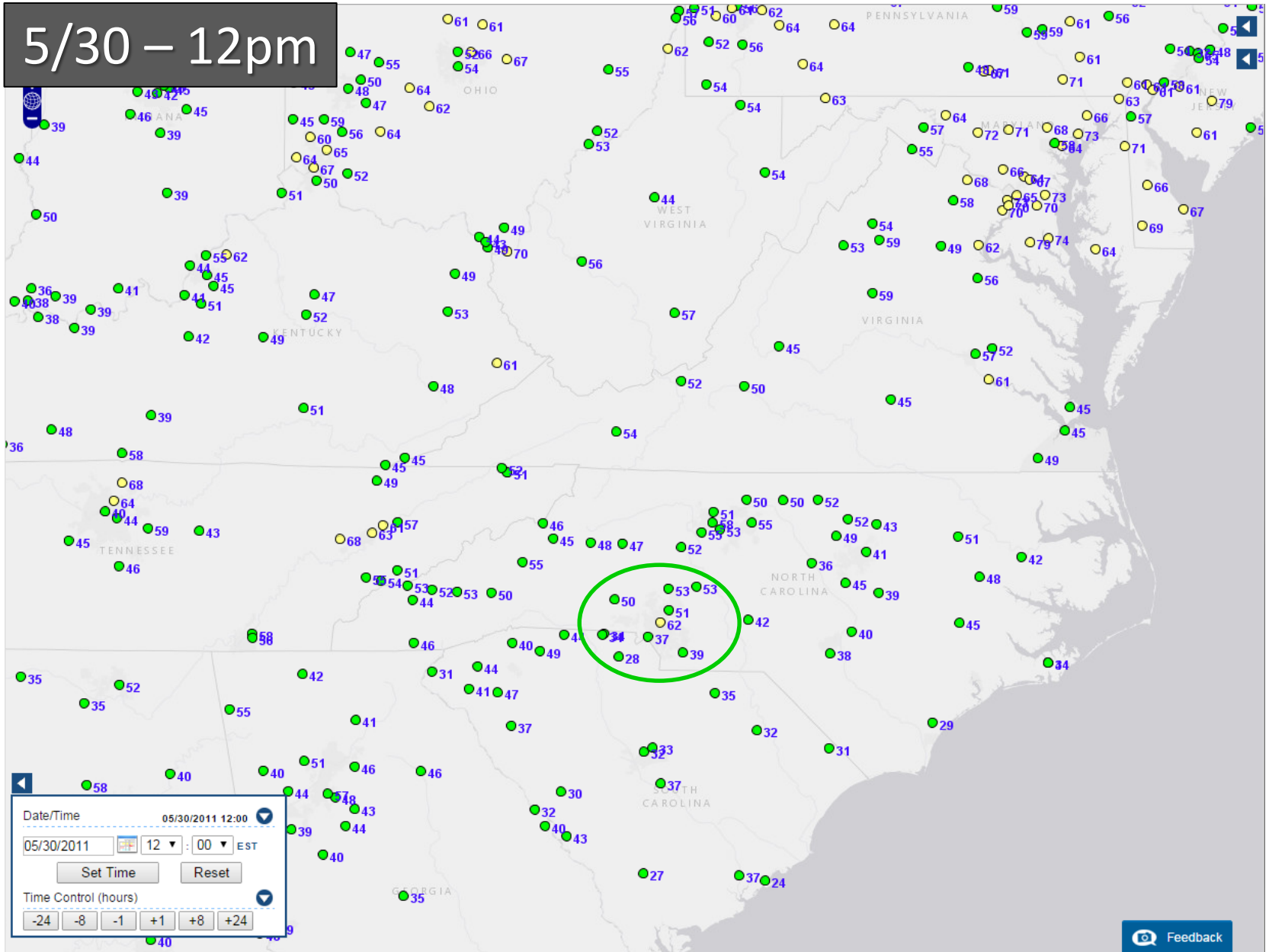
# 6/1/2011

Slide 21

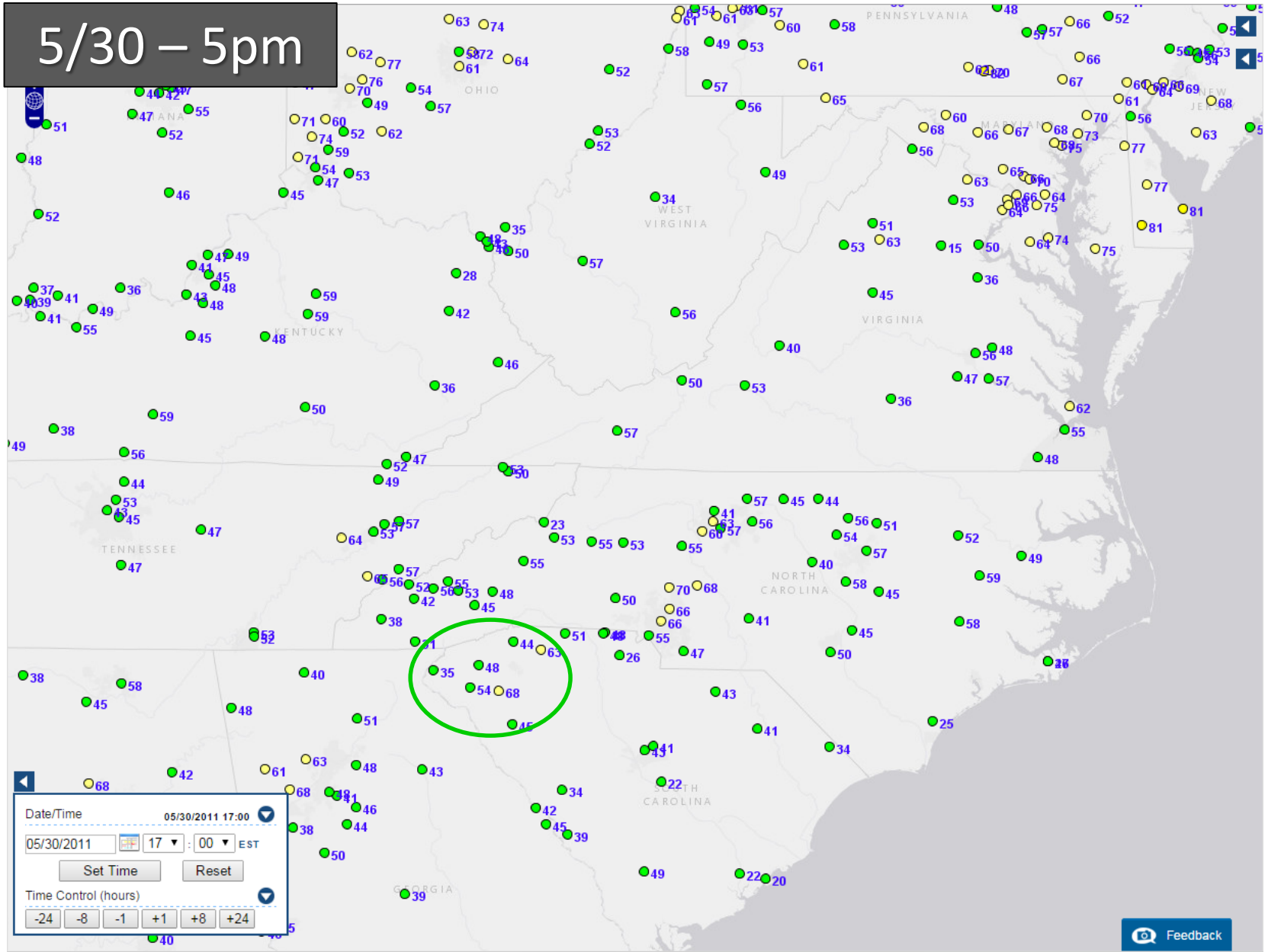
- 5/30 around noon mid-level trajectories passed through Charlotte region:
  - Late-afternoon (by 5pm) moved through Upstate SC
    - N. Spart. FS, SC monitor 1 hr ozone levels rose 49 to 63 ppb
    - Big Creek, SC monitor 1 hr ozone levels rose 47 to 68 ppb
- 5/31 (24 hrs later) passed through N. KY
  - Buckner, KY monitor increased 16 ppb
  - Cannons Lane, KY monitor increased 10 ppb from
- Ozone levels on 5/31 in upper 70s ppb upstream of monitors that exceeded on 6/1
  - Including southern PA, southeastern OH
- Some contribution from Charlotte region can not be ruled out
  - Significant ozone concentrations already measured in immediately upstream locations prior to NC trajectories arrival



# 6/1/2011

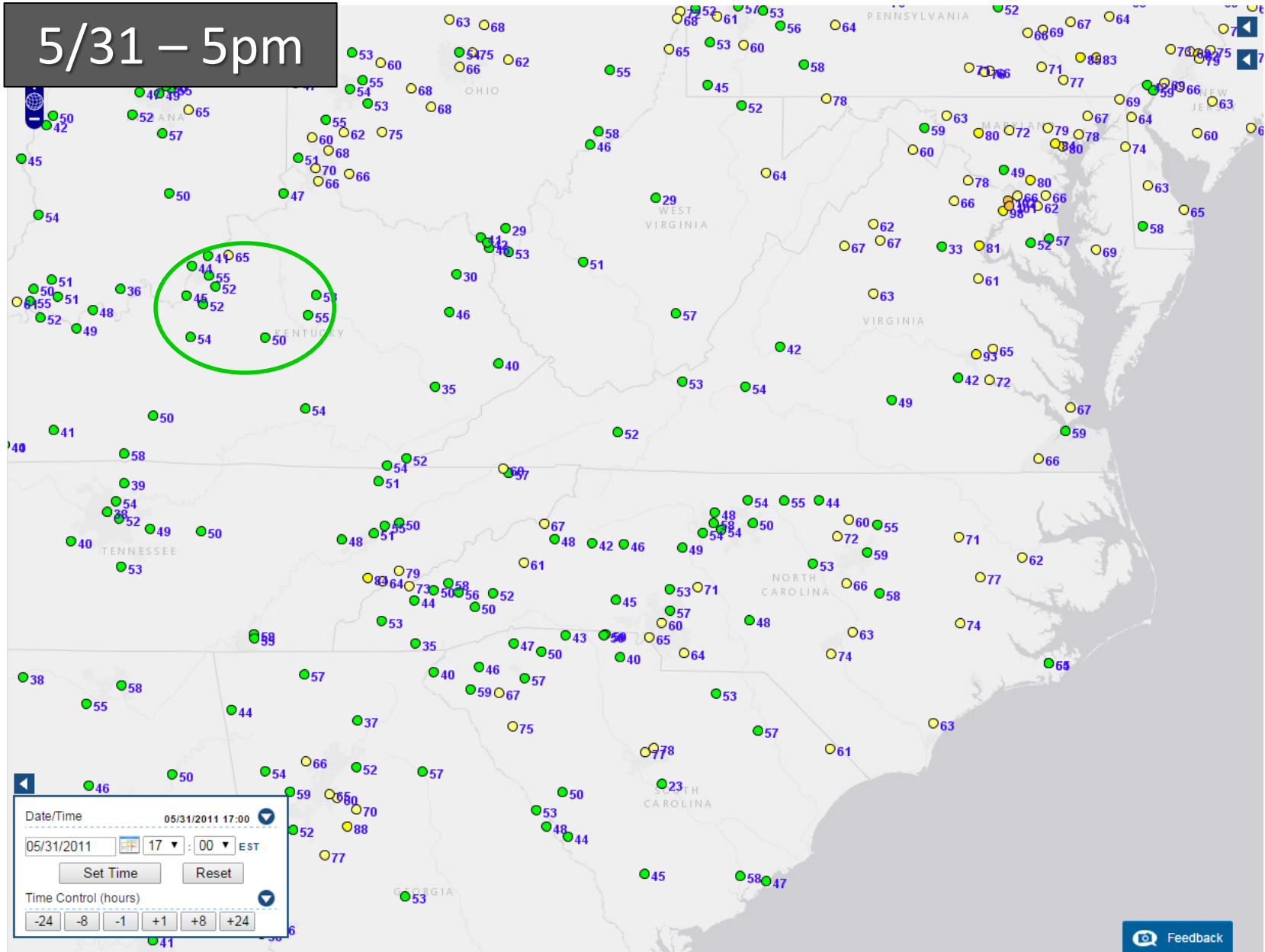


# 6/1/2011





# 6/1/2011



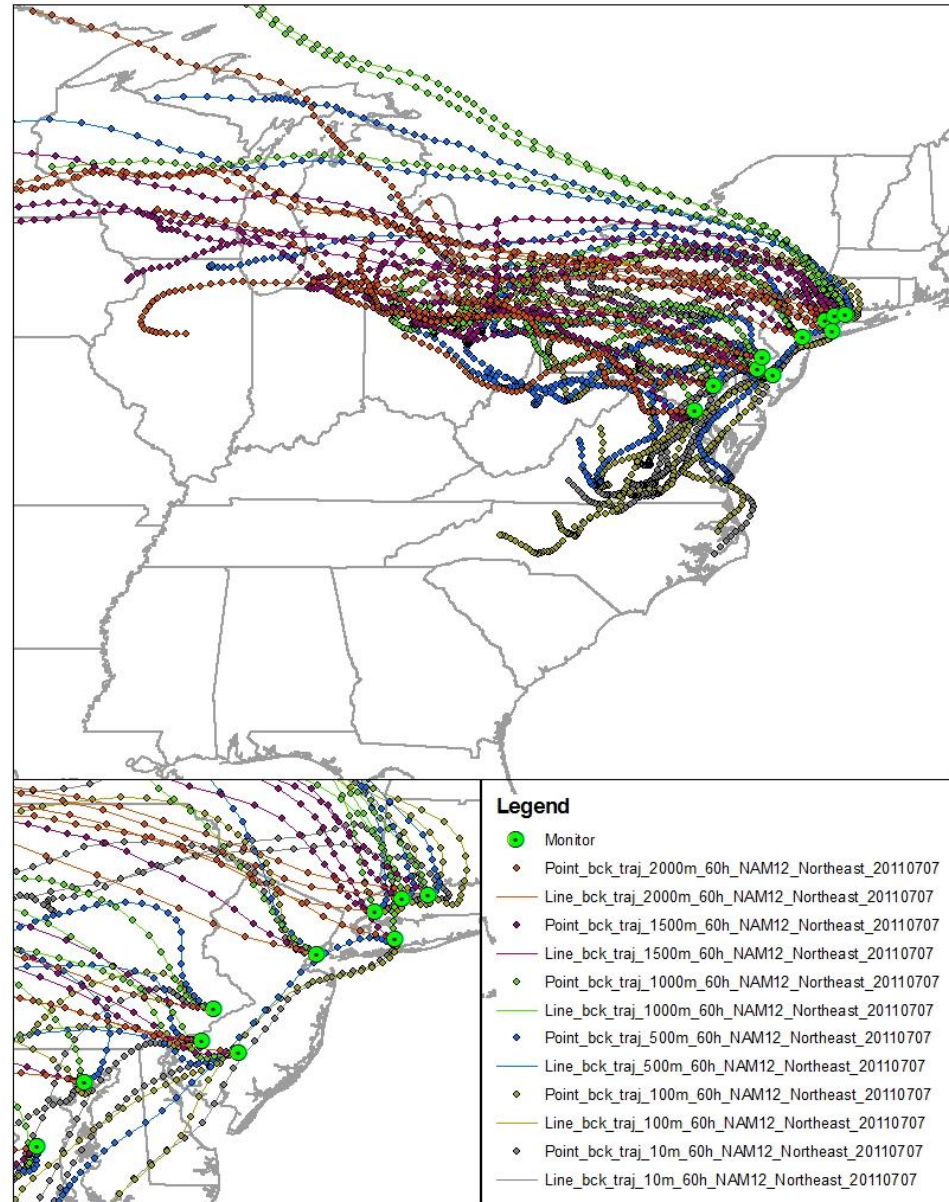
# 7/7/2011

- Exceeding monitors:

- Babylon NY: 99 PPB
- Wagner NY: 90 PPB
- Clarksboro NJ: 89 PPB
- Edgewood MD: 87 PPB
- Stratford CT: 87 PPB
- Westport CT: 87 PPB
- Greenwich CT: 86 PPB
- PG Eq. Center MD: 83 PPB
- Philadelphia (NEA): 82 PPB
- Ancona NJ: 80 PPB

- Minimal NC impacts

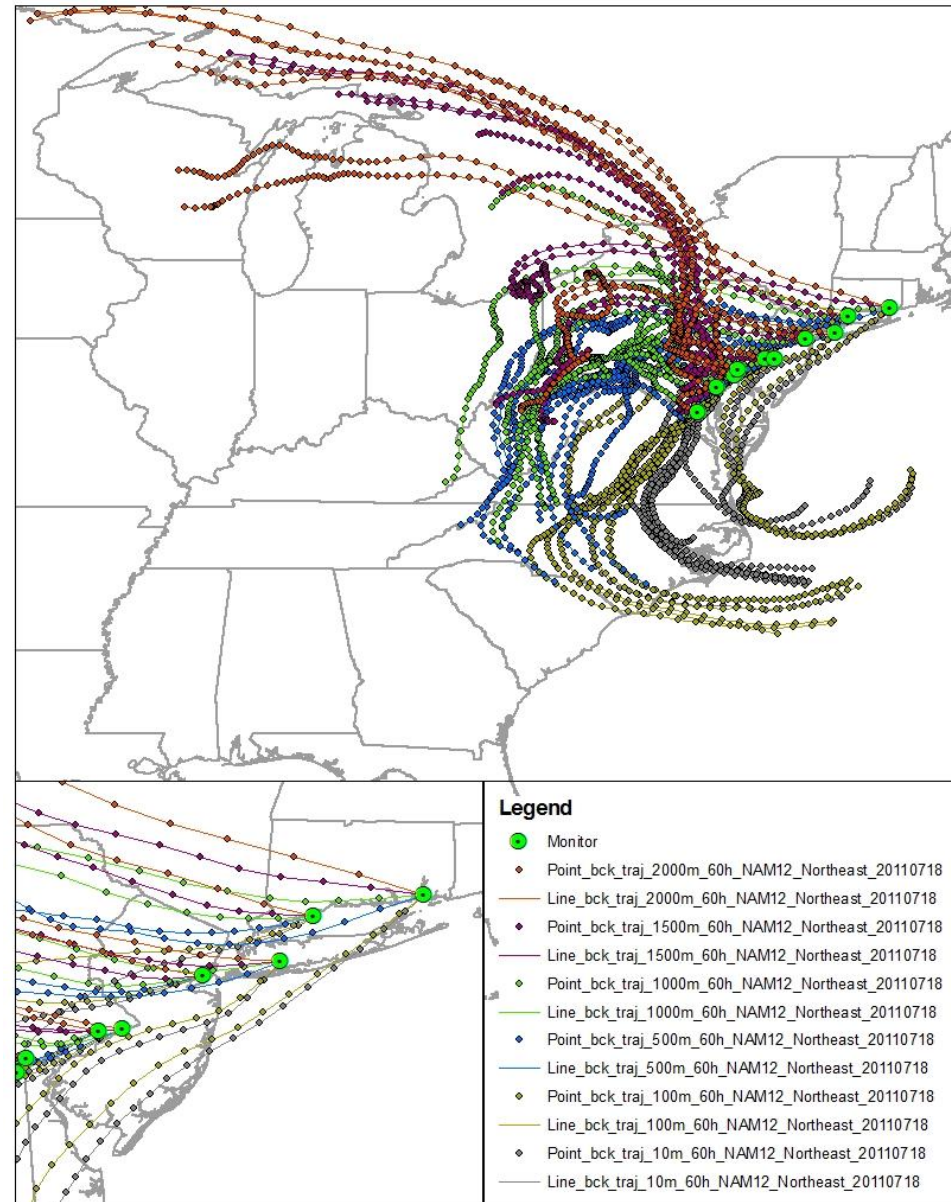
- Monitors in VA reported hourly ozone concentrations 10-20 ppb lower (41-44 ppb) than previous day as NC trajectory points passed overhead on 7/7
- PG Eq. Center 100m trajectory over Charlotte area 7/5/11.
  - County Line: 82 PPB.



# 7/18/2011

Slide 26

- Exceeding monitors:
  - Philadelphia (NEA): 87 PPB
  - Fair Hill MD: 86 PPB
  - Groton CT: 83 PPB
  - Edgewood MD: 82 PPB
  - Stratford CT: 82 PPB
  - Bristol PA: 81 PPB
  - PG. Eq. Ctr., MD: 80 PPB
  - Newgarden PA: 79 PPB
  - Babylon NY: 77 PPB
  - Wagner NY: 77 PPB
- Virtually no impact from NC
  - Trajectories passed through NC on 7/16
  - Highest statewide 8hr max ozone was 51ppb at Durham Armory
  - 7/17 hourly ozone levels where trajectories crossed e. VA: 35-40ppb (no increase from prev. 24hr)
  - 7/17 hourly ozone levels where trajectories crossed s. PA: 46-48ppb (+2 to +3 ppb from 24hr earlier)

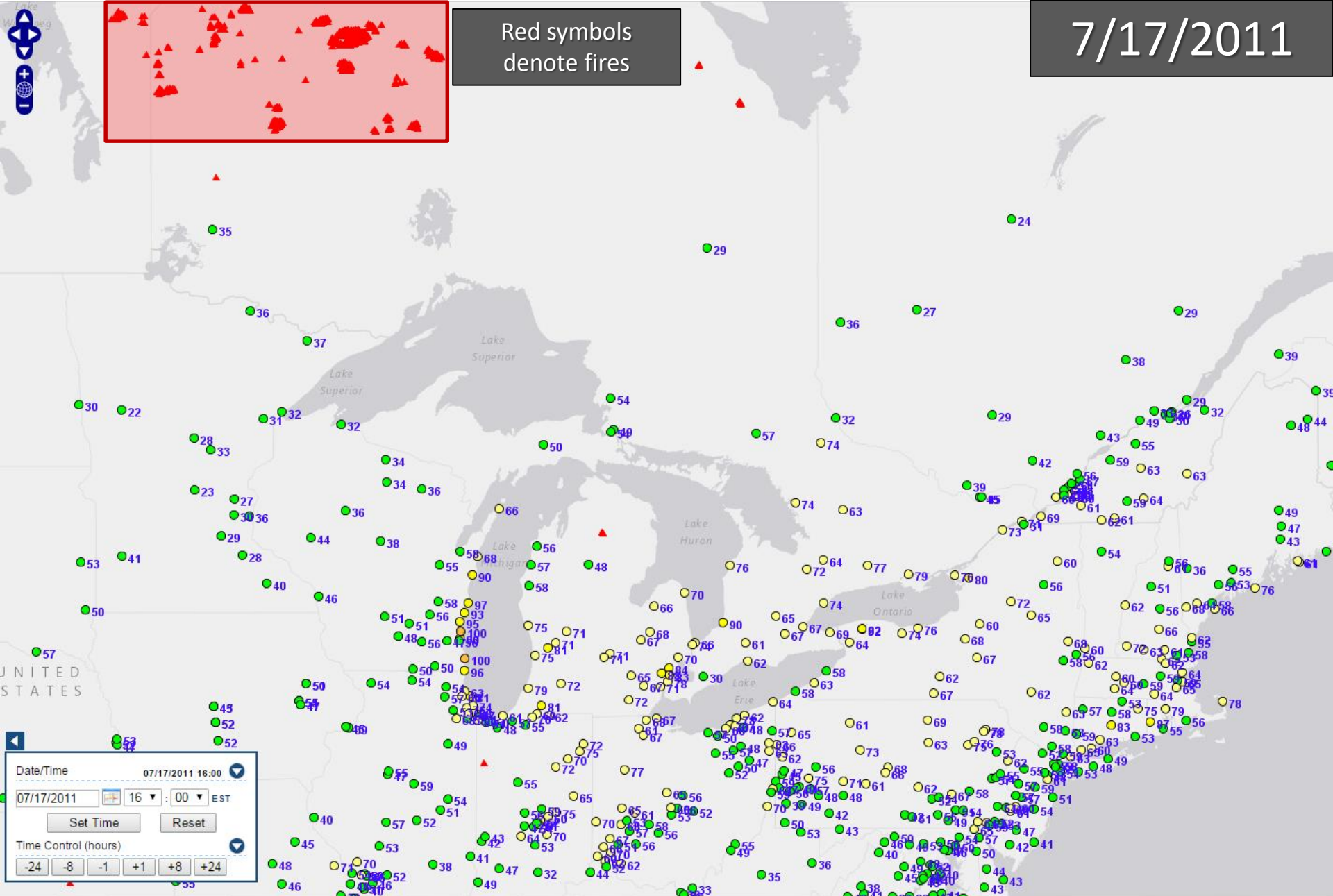




# 7/18/2011

## 7/17/2011

Red symbols  
denote fires



# 7/18/2011

Slide 28

## Exceeding monitors:

- Philadelphia (NEA): 87 PPB
- Fair Hill MD: 86 PPB
- Groton CT: 83 PPB
- Edgewood MD: 82 PPB
- Stratford CT: 82 PPB
- Bristol PA: 81 PPB
- PG. Eq. Ctr., MD: 80 PPB
- Newgarden PA: 79 PPB
- Babylon NY: 77 PPB
- Wagner NY: 77 PPB

## 10m trajectories

- Across NC Coast 7/16/11.
  - 8-hour values in the 30s to lower 40s.
- Across northern VA/southern DELMARVA 7/17/11.
  - 8-hour values in the 30s to lower 40s.
  - Stratford CT 10m trajectory over NE MD, 8-hour value 61 PPB 7/17/11.

## 100m trajectories

- Across SE NC/NE SC 7/16/11.
  - 8-hour values in the upper 30s/near 40.
- Across central/eastern VA 7/17/11.
  - 8-hour values in the upper 30s/lower 40s.

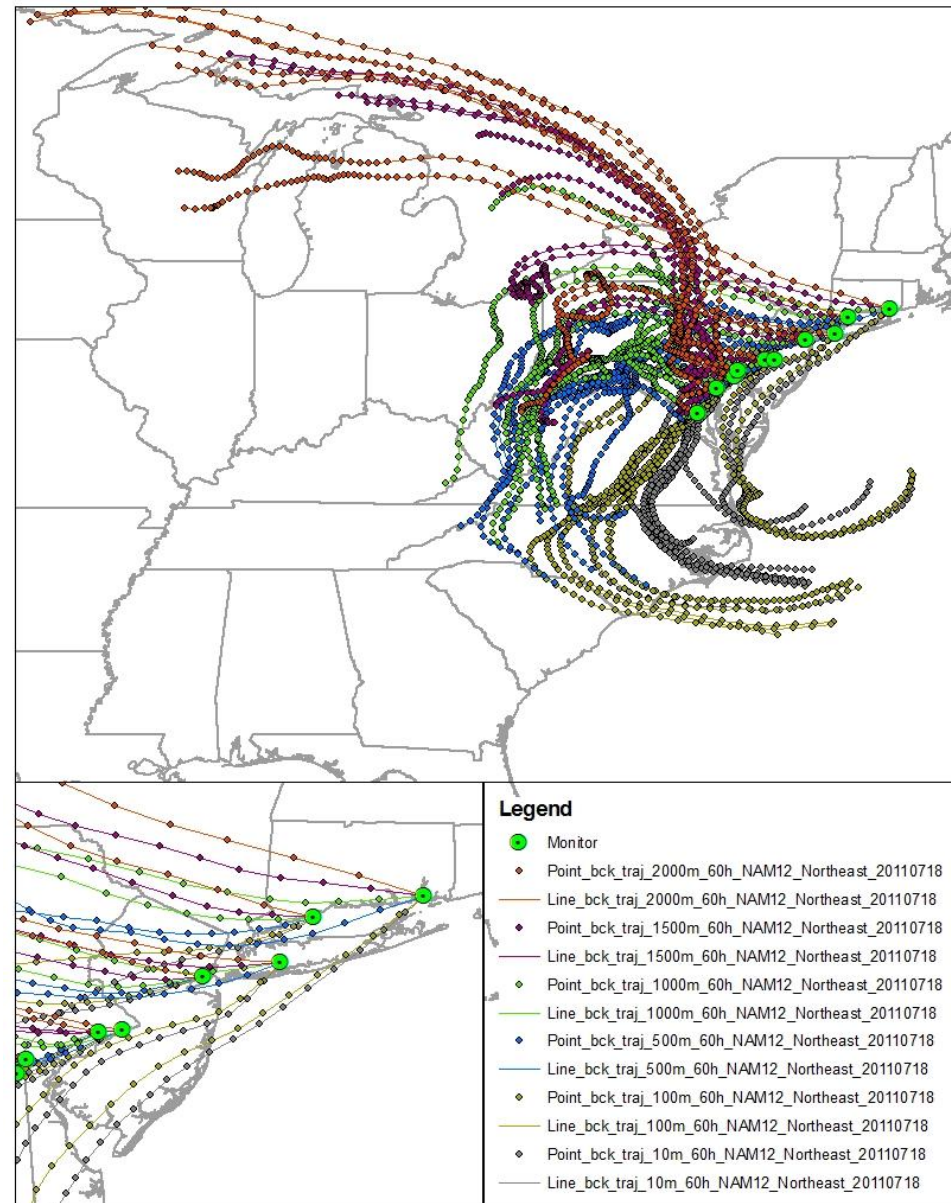
## 500m trajectories

- Across central/western NC into VA/WV 7/16/11.
  - 8-hour values in the 30s to lower 40s.
- Across northern VA/western MD/southern PA
  - 8-hour values in the low/mid-40s.

## 1000m trajectories

- From NW NC into WV/SE OH 7/16/11.
  - 8-hour values in the 30s to lower 40s.

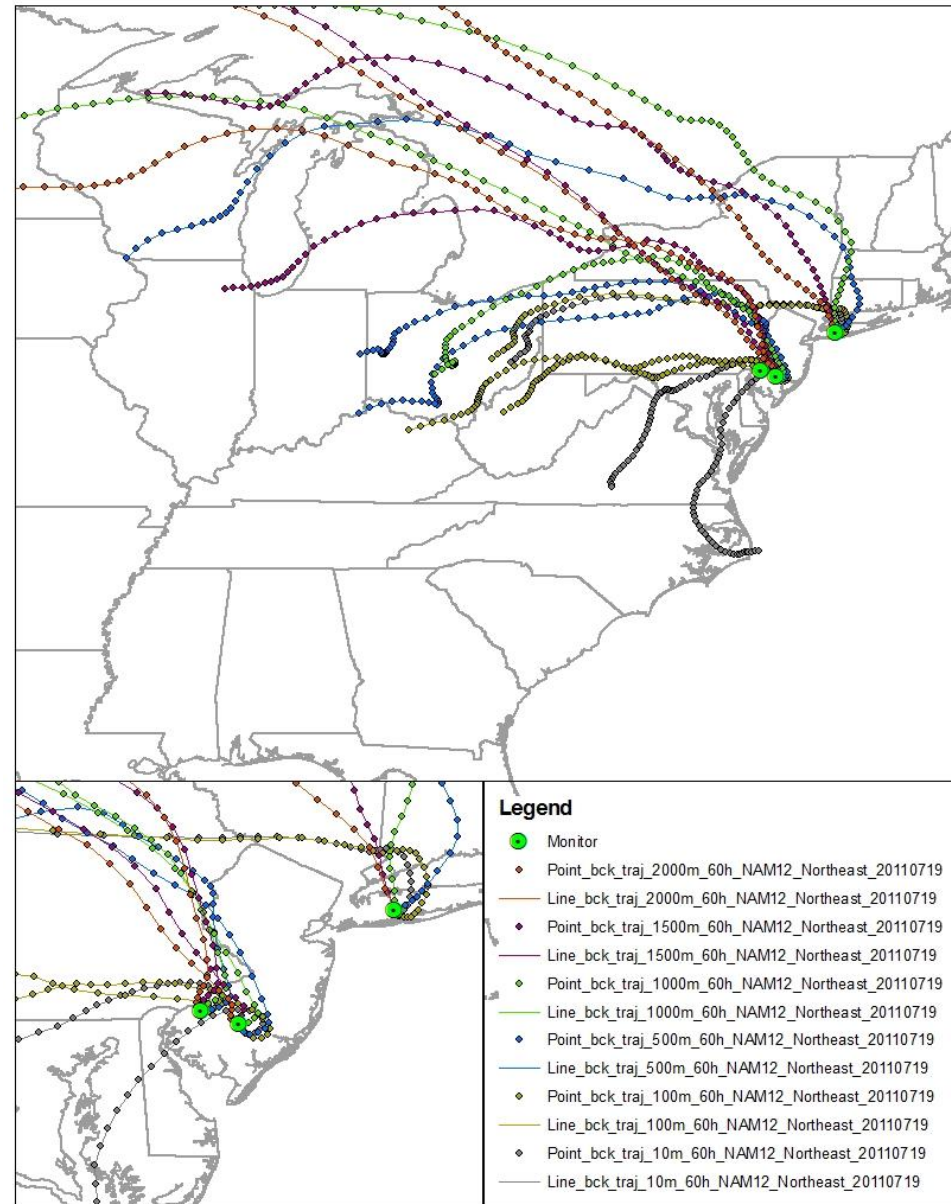
## Conclusion: No impact from NC was observed.



# 7/19/2011

Slide 29

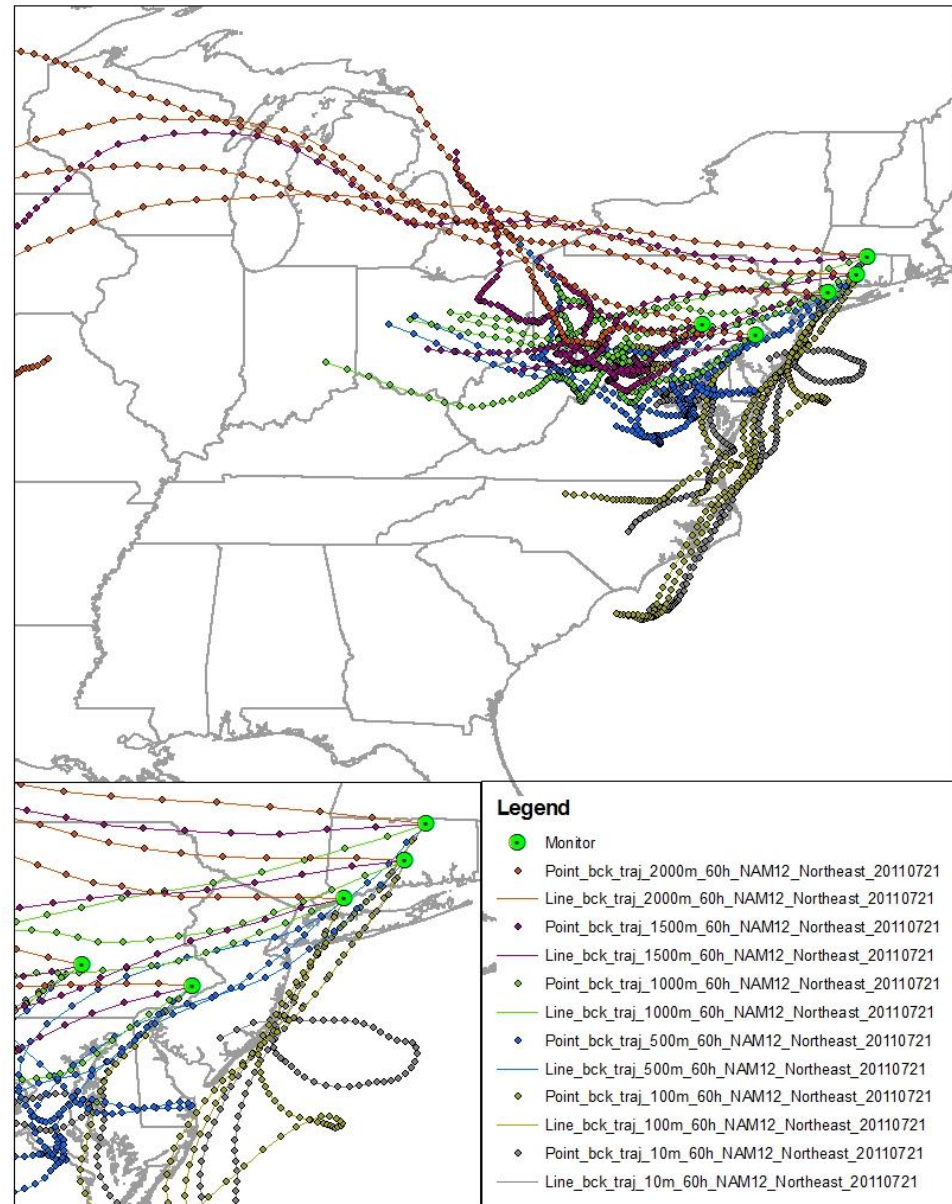
- Exceeding monitors:
  - Clarksboro NJ: 92 PPB
  - Ancona NJ: 77 PPB
  - Babylon NY: 76 PPB
- Ancona 10m trajectory
  - Across northeastern NC Coastal Plain, 7/17/11.
    - Jamesville NC: 41 PPB
    - No major emission sources in this area.
  - Across Chesapeake Bay, 7/18/11.
    - PG Eq. Ctr MD: 54 PPB
- Re-circulating trajectories observed over exceeding sites, morning/midday 7/19/11.





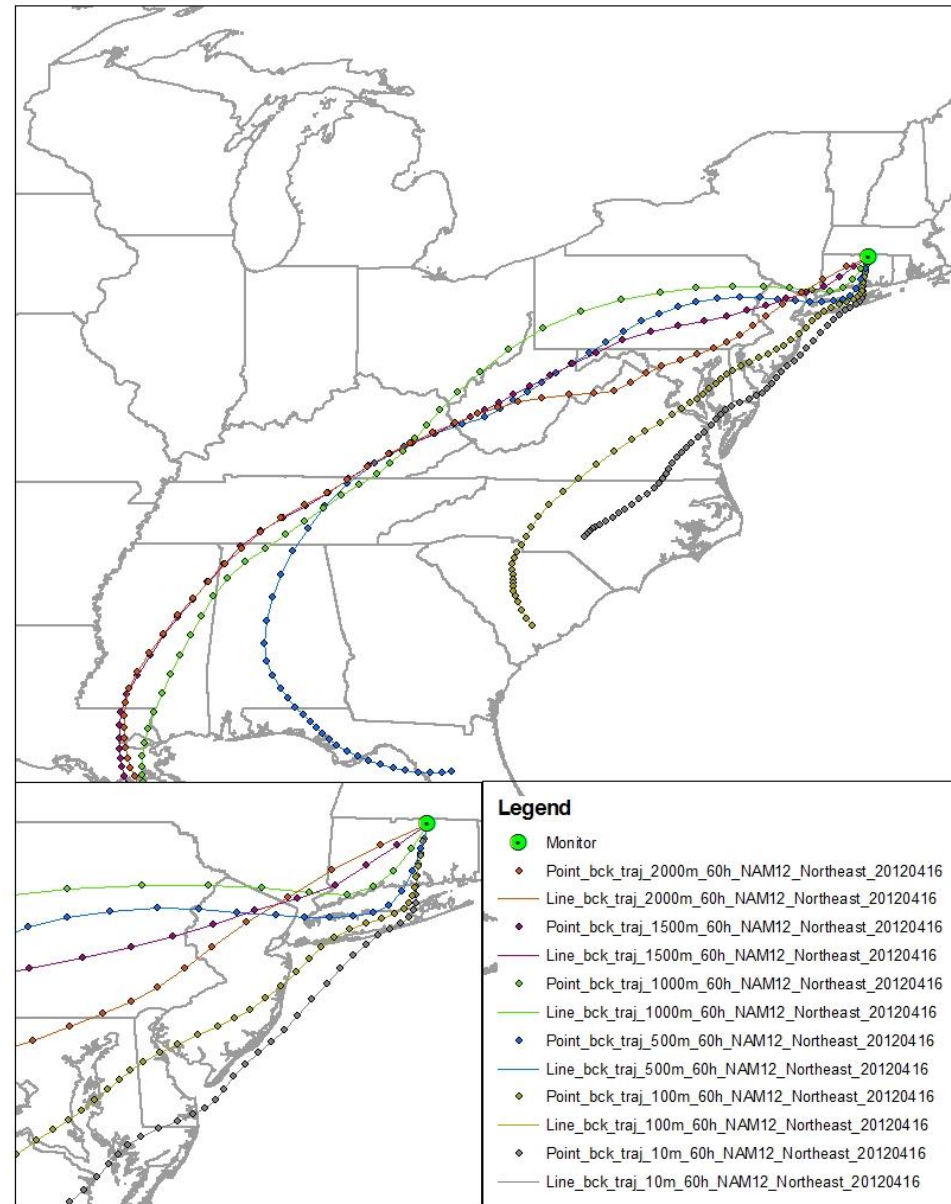
# 7/21/2011

- Exceeding monitors:
  - Philadelphia (NEA) PA: 85 PPB
  - Lebanon PA: 85 PPB
  - Stafford CT: 82 PPB
  - Middletown CT: 79 PPB
  - Westport CT: 77 PPB
- Additional high 8-hour values 80+ PPB central NJ & central MA, 7/21/11.
- PHL/CT 10m trajectories
  - Across eastern NC 7/19/11.
    - Jamesville 8-hour 65 PPB
    - Beaufort 8-hour 50 PPB.
  - Interior DELMARVA/off NJ coast 7/20/11.
    - Eastern MD 8-hour 62 PPB.
- PHL 100m trajectory
  - Across eastern Triangle 7/19/11.
    - Leggett NC 65 PPB.
- 500m trajectories over DC Metro, northern WV 7/20/11.
  - 8-hour values 60s/70s, localized 86 PPB DC area, 50s northern WV.
- Little or no impact from NC observed from this event.
  - Evidence points to localized impacts from DC/PHL area.



# 4/16/2012

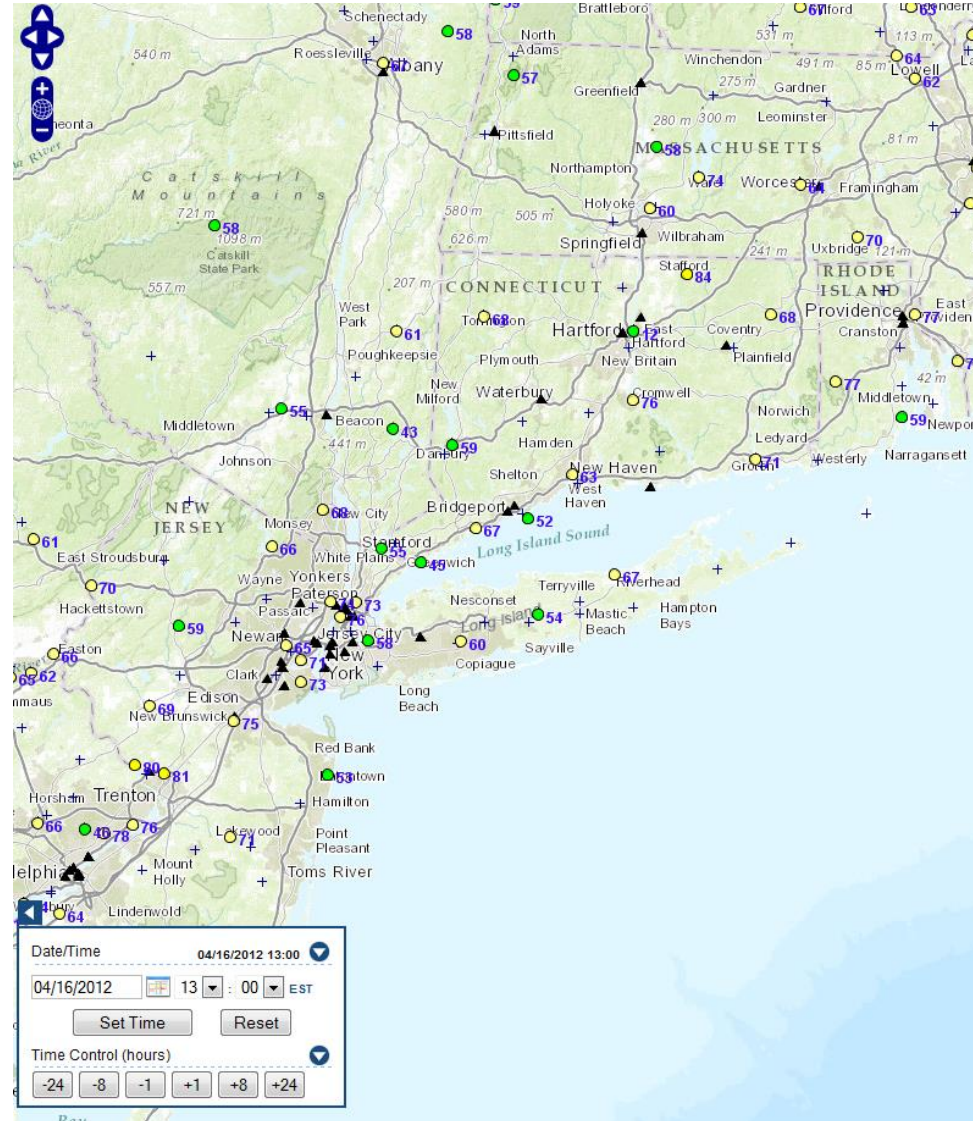
- Exceeding monitors:
  - Stafford CT: 79 PPB
- 10m trajectory through Triangle 4/14/12, then near Delaware and southern NJ 4/15/12.
  - 8-hour values near 60 PPB, 4/14/12.
  - 8-hour values near 60 PPB, 4/15/12.
- 100m trajectory through Charlotte 4/14/12, then southern NJ 4/15/12.
  - County Line NC: 65 PPB
  - Ancora St. Hsptl., NJ: 69 PPB
- Stafford 1-hour @ 67 PPB 9AM EST, 4/16/12.
  - 1-hour values increase to 75+ PPB by 12PM EST, hold through 5PM.





# 4/16/2012

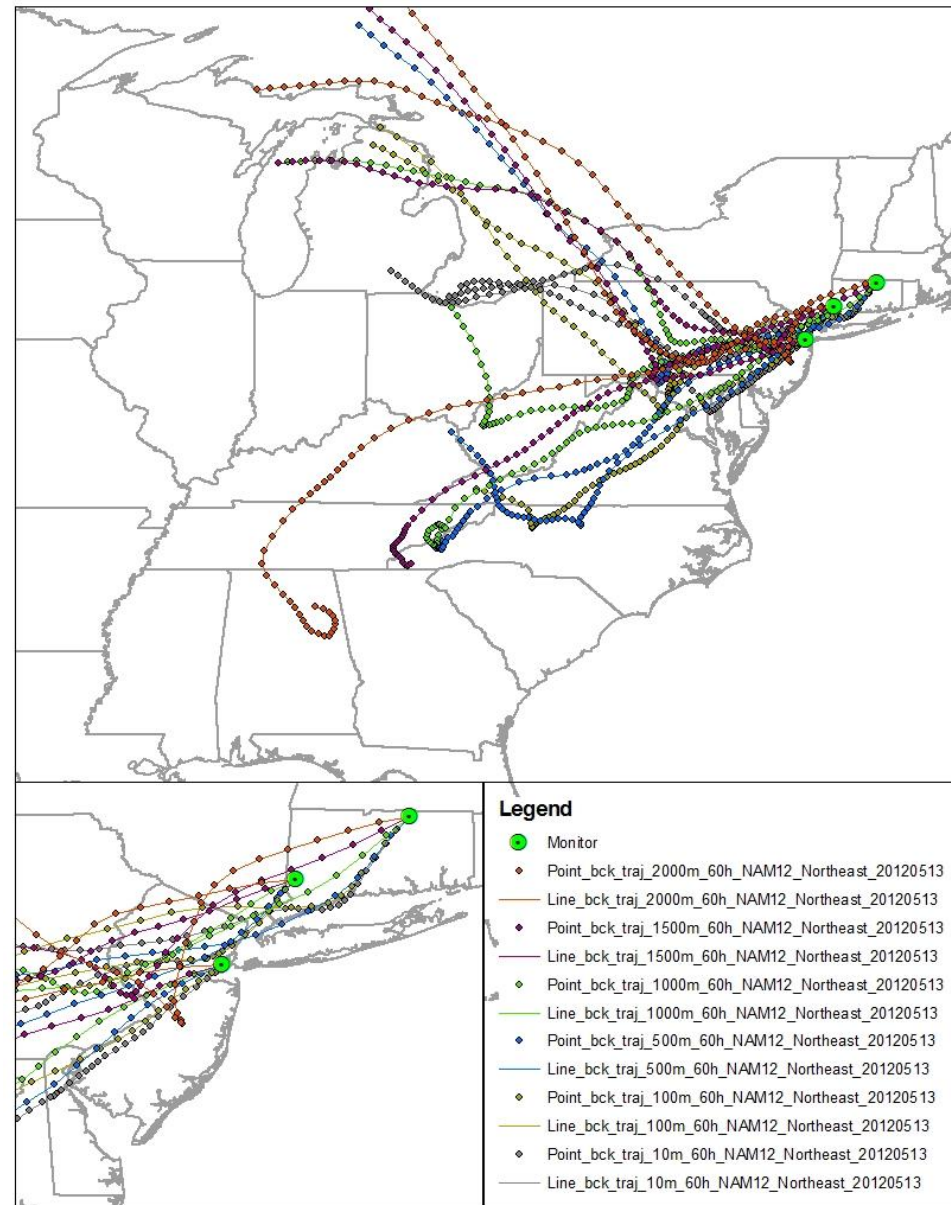
- Exceeding monitors:
  - Stafford CT: 79 PPB
- 10m trajectory through Triangle 4/14/12, then near Delaware and southern NJ 4/15/12.
  - 8-hour values near 60 PPB, 4/14/12.
  - 8-hour values near 60 PPB, 4/15/12.
  - No NC impact apparent on this event.
- 100m trajectory through Charlotte 4/14/12, then southern NJ 4/15/12.
  - County Line NC: 65 PPB
  - Ancora St. Hsptl., NJ: 69 PPB
- Stafford 1-hour @ 67 PPB 9AM EST, 4/16/12.
  - 1-hour values increase to 75+ PPB by 12PM EST, hold through 5PM.



# 5/13/2012

Slide 33

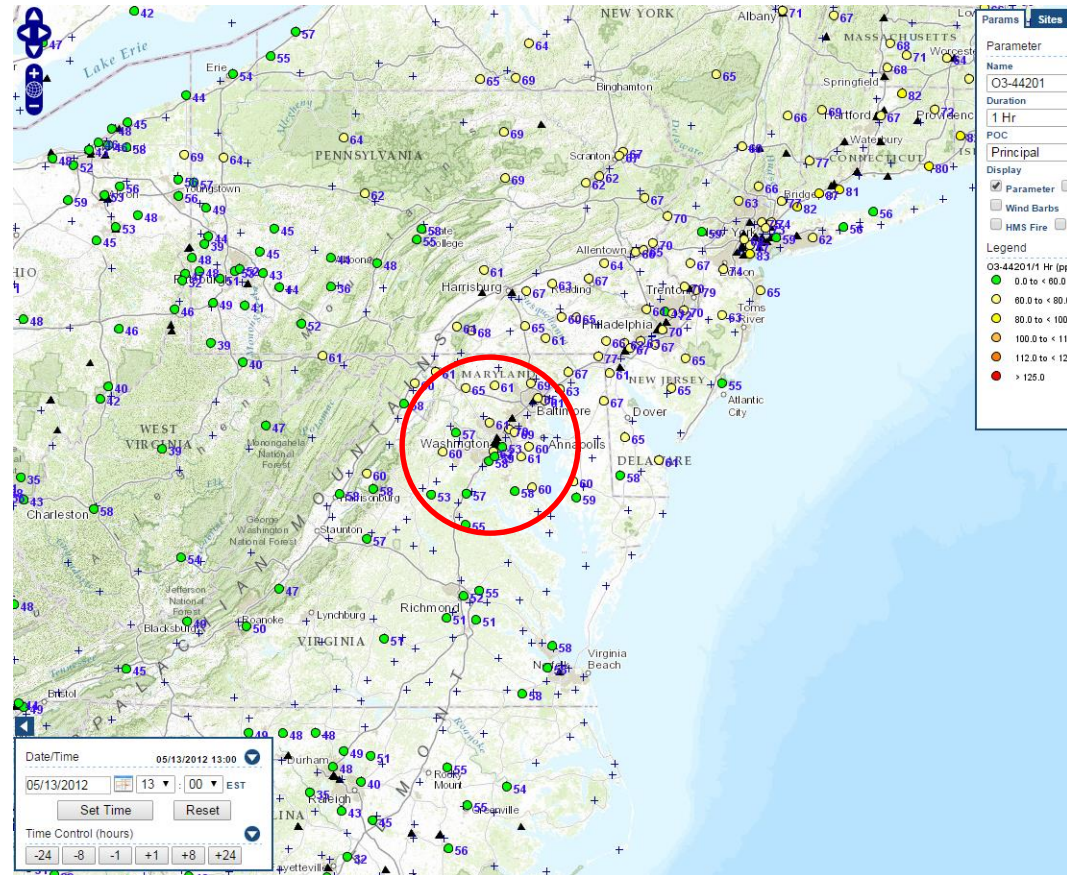
- Exceeding monitors:
  - Stafford CT: 86 PPB
  - Wagner NY: 77 PPB
  - Danbury CT: 77 PPB
- Wagner 100m trajectory
  - Across northern NC 5/11/12.
    - Bethany NC: 55 PPB
  - Across northern VA 5/12/12.
    - Widewater VA: 59 PPB
- Wagner 500m trajectory
  - Across northern NC Mountains, 5/11/12.
    - Area monitors in the mid-upper 50s PPB.
  - Across central VA, 5/12/12.
    - No monitor in immediate vicinity, but Prince Edward VA monitor at 59 PPB.
- Danbury 500m & Wagner 1000m trajectories over central NC mountains, 5/11/12.
  - Purchase Knob NC: 55 PPB.
- Aftn. cloud cover limited 8-hour ozone averages in MD/PHL 5/13/12, but 1-hour values upwind in northern VA peaked in the upper 50s into the midday as DC-downwind sites concurrently increased into the 60s and 70s PPB.
- NC contribution to these exceedances unlikely. Evidence more suggestive of localized impacts.





# 5/13/2012

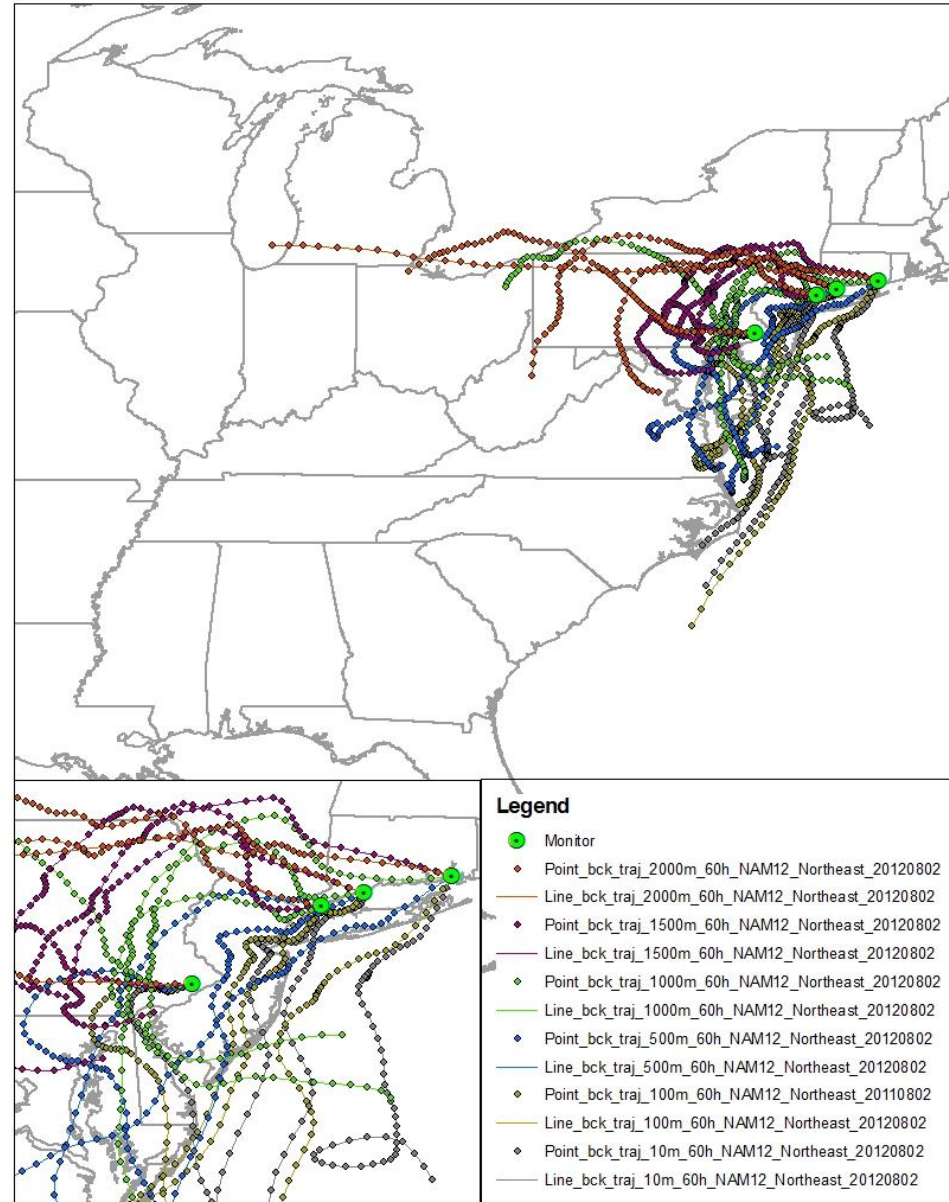
- Exceeding monitors:
  - Stafford CT: 86 PPB
  - Wagner NY: 77 PPB
  - Danbury CT: 77 PPB
- Wagner 100m trajectory
  - Across northern NC 5/11/12.
    - Bethany NC: 55 PPB
  - Across northern VA 5/12/12.
    - Widewater VA: 59 PPB
- Wagner 500m trajectory
  - Across northern NC Mountains, 5/11/12.
    - Area monitors in the mid-upper 50s PPB.
  - Across central VA, 5/12/12.
    - No monitor in immediate vicinity, but Prince Edward VA monitor at 59 PPB.
- Danbury 500m & Wagner 1000m trajectories over central NC mountains, 5/11/12.
  - Purchase Knob NC: 55 PPB.
- Aftn. cloud cover limited 8-hour ozone averages in MD/PHL 5/13/12, but 1-hour values upwind in northern VA peaked in the upper 50s into the midday as DC-downwind sites concurrently increased into the 60s and 70s PPB.
- NC contribution to these exceedances unlikely. Evidence more suggestive of localized impacts.



# 8/2/2012

Slide 35

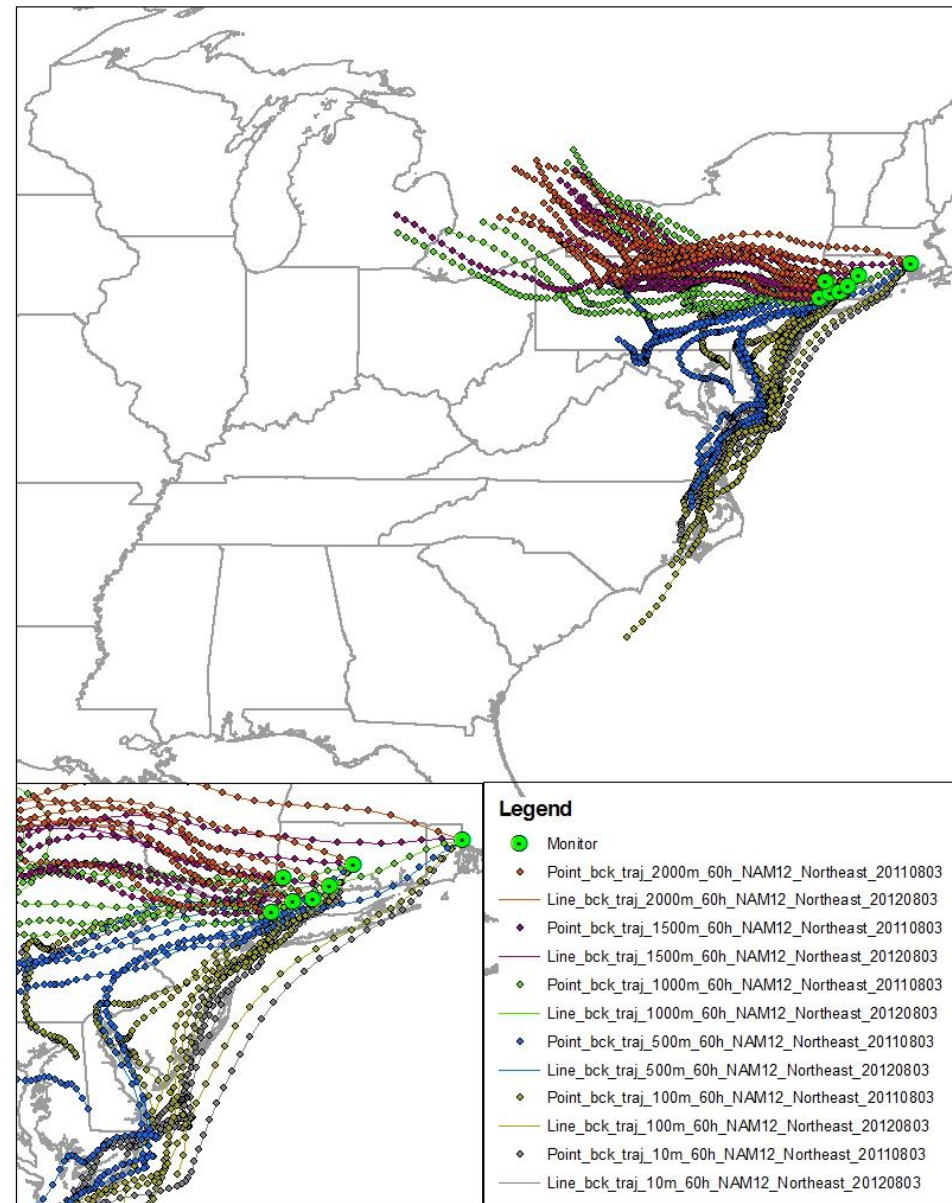
- Exceeding monitors:
  - Greenwich CT: 81 PPB
  - Stratford CT: 78 PPB
  - Groton CT: 77 PPB
  - Philadelphia (NEA) PA: 77 PPB
- 10m back trajectories moved along NC Outer Banks 7/30/12.
- No NC impact to this event.



# 8/3/2012

Slide 36

- Exceeding monitors:
  - Stratford CT: 84 PPB
  - Danbury CT: 81 PPB
  - Middletown CT: 80 PPB
  - E. Providence RI: 79 PPB
  - Westport CT: 78 PPB
  - Greenwich CT: 77 PPB
  - New Haven CT: 77 PPB
- 10m, 100m, and 500m trajectories moved along NC northern Coastal Plain, 8/1/12.
  - Beaufort, NC: 43 PPB
- No NC impact to this event.

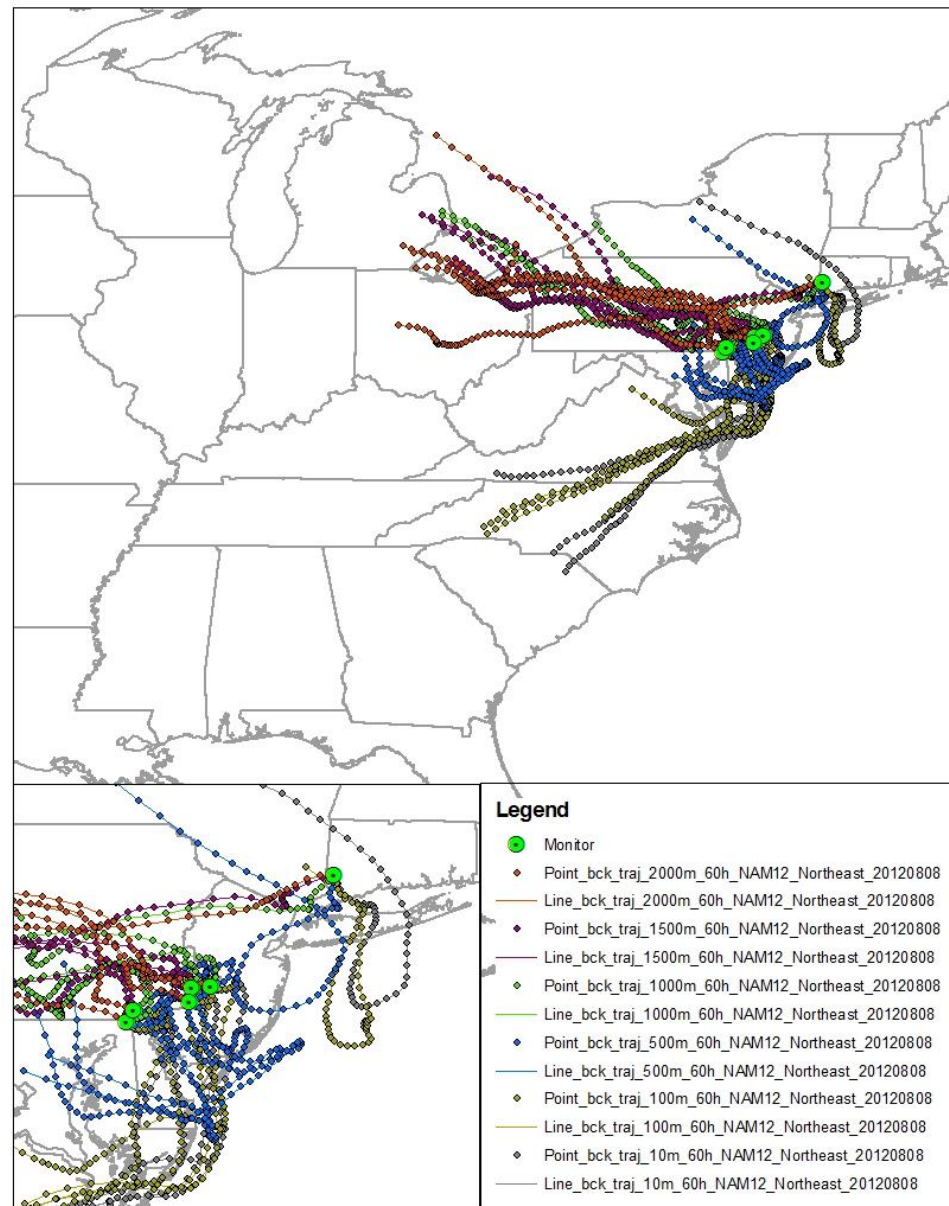




# 8/8/2012

Slide 37

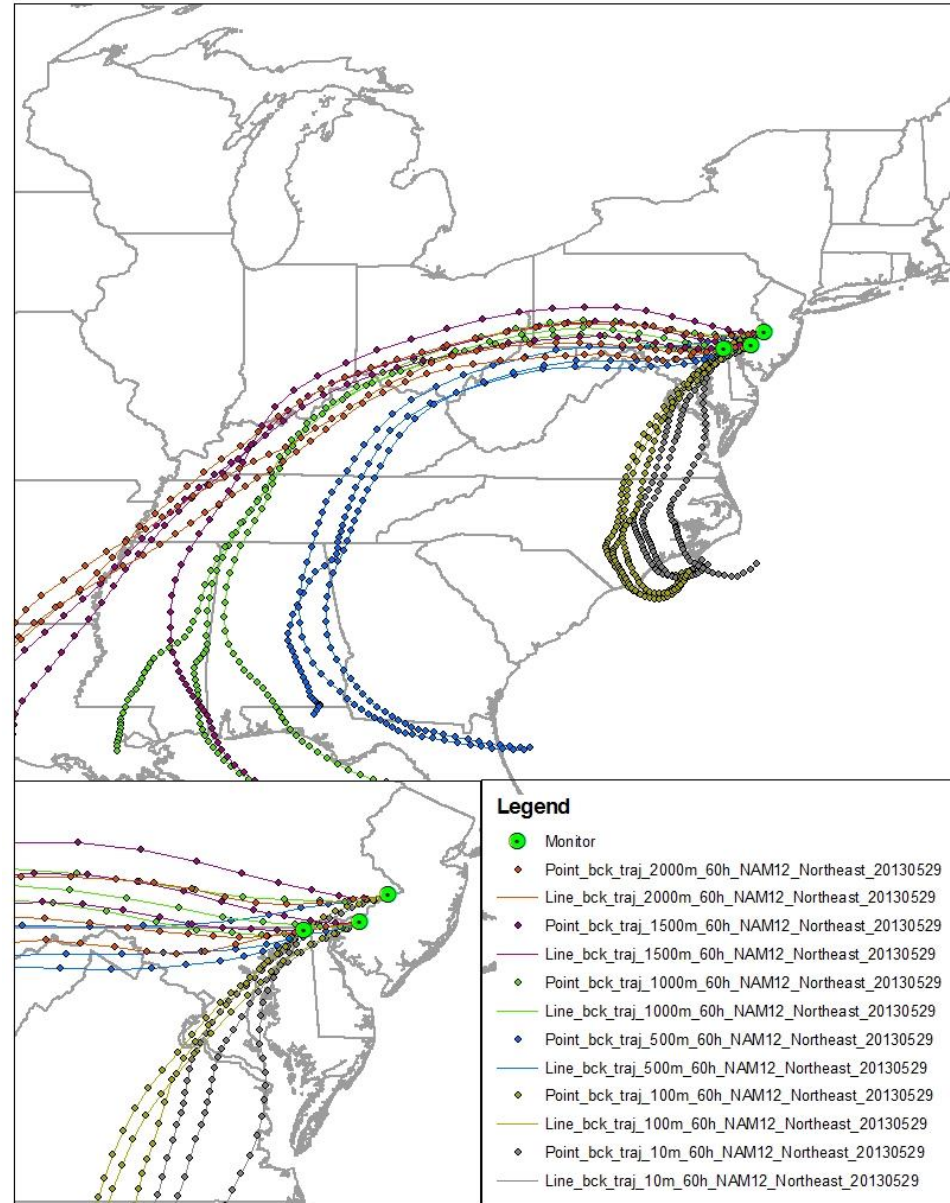
- Exceeding monitors:
  - Philadelphia (NEA) PA: 84 PPB
  - Camden NJ: 83 PPB
  - Bristol PA: 80 PPB
  - Fair Hill MD: 80 PPB
  - Newgarden PA: 79 PPB
  - Danbury CT: 78 PPB
- 10m trajectories
  - Through Triangle area and southern VA, 8/6/12.
    - 8-hour values 20s and 30s.
  - Nearly stationary over PHL area, 8/8/12.
- 100m trajectories
  - Across northern Triangle, 8/6/12.
    - Bushy Fork, NC: 37 PPB
    - Cherry Grove, NC: 41 PPB
- 500m trajectories re-circulate over DELMARVA and NJ, 8/7/12-8/8/12.
- Little or no NC impact observed.



# 5/29/2013

Slide 38

- Exceeding monitors:
  - Fair Hill MD: 80 PPB
  - Clarksboro NJ: 78 PPB
  - Bristol PA: 77 PPB
- 10/100m trajectories near NC Coast 5/27/13, near Richmond VA 5/28/13.
  - 8-hour values in the mid-50s @ Castle Hayne & Beaufort 5/27/13.
  - Norfolk VA area 8-hour near 50 PPB 5/28/13.
  - Richmond VA area 8-hour in the 40s 5/28/13.
- 500m trajectories through TN, southern KY 5/28/13.
  - 8-hour values in the lower 50s, 5/28/13.
- 1-hour 90 PPB value @ Fair Hill MD 1PM EST, 80+ PPB spread NE into greater PHL area through the rest of the afternoon.
- No NC impact observed.

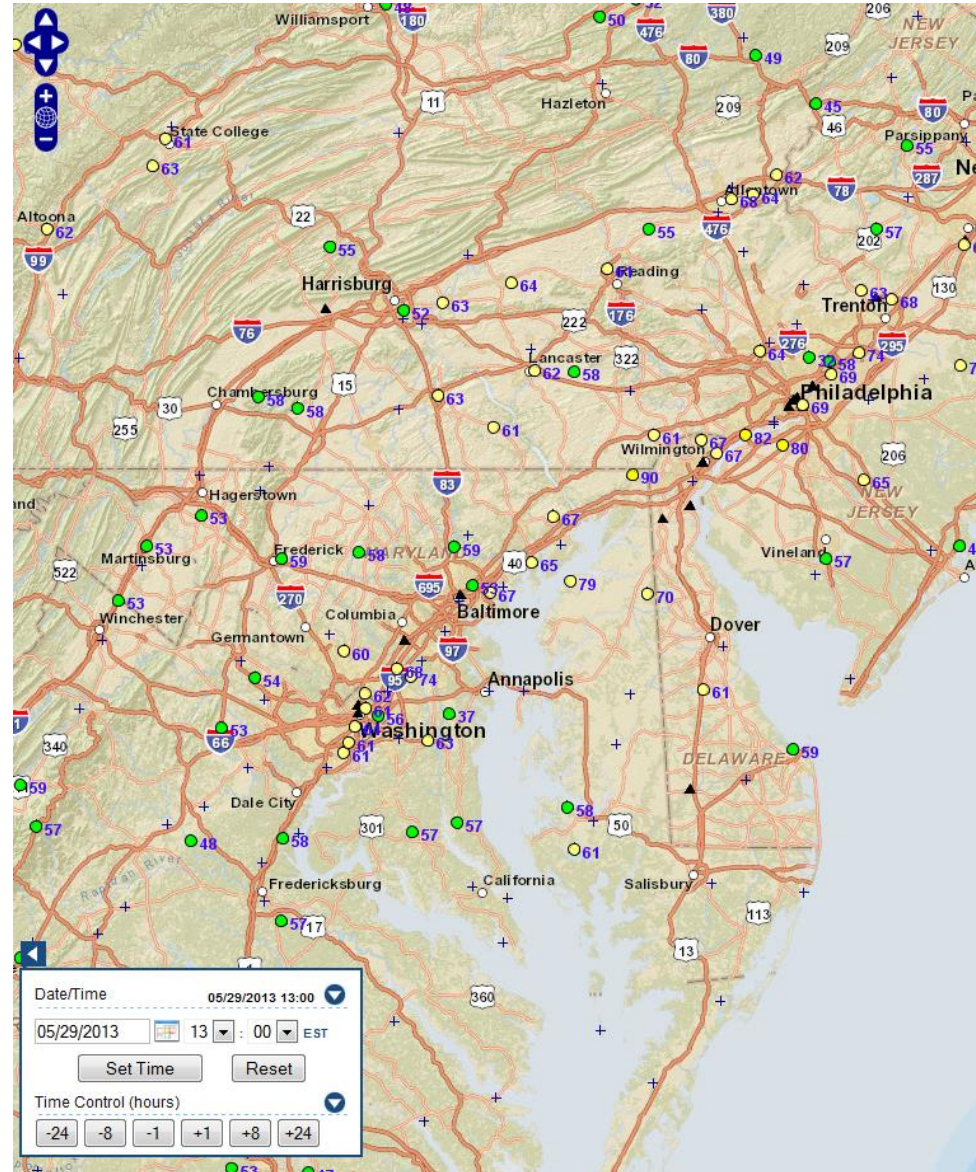




# 5/29/2013

Slide 39

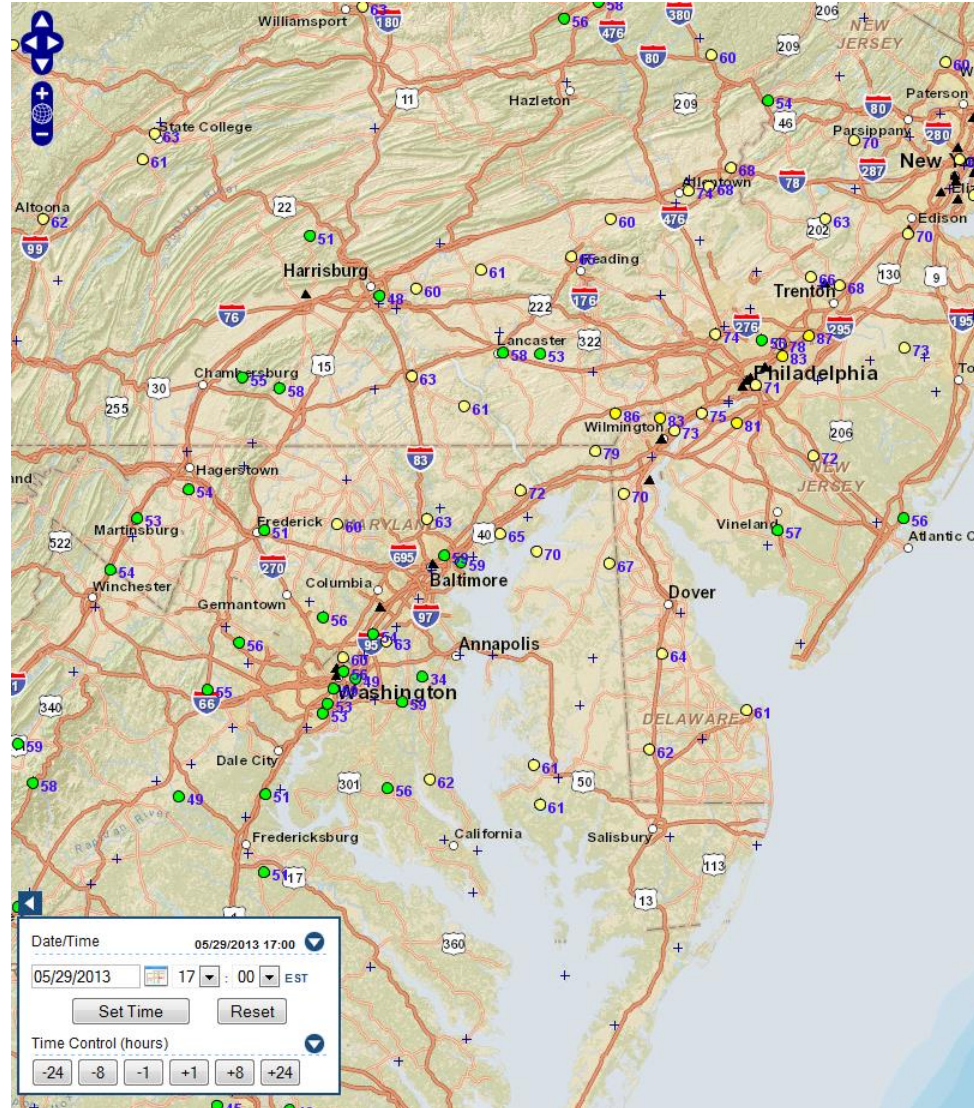
- Exceeding monitors:
  - Fair Hill MD: 80 PPB
  - Clarksboro NJ: 78 PPB
  - Bristol PA: 77 PPB
- 10m trajectories near NC Coast 5/27/13, near Richmond VA 5/28/13.
  - 8-hour values in the mid-50s @ Castle Hayne & Beaufort 5/27/13.
  - Norfolk VA area 8-hour near 50 PPB 5/28/13.
  - Richmond VA area 8-hour in the 40s 5/28/13.
- 500m trajectories through TN, southern KY 5/28/13.
  - 8-hour values in the lower 50s, 5/28/13.
- 1-hour 90 PPB value @ Fair Hill MD 1PM EST, 80+ PPB spread NE into greater PHL area through the rest of the afternoon.
- No NC impact observed.





# 5/29/2013

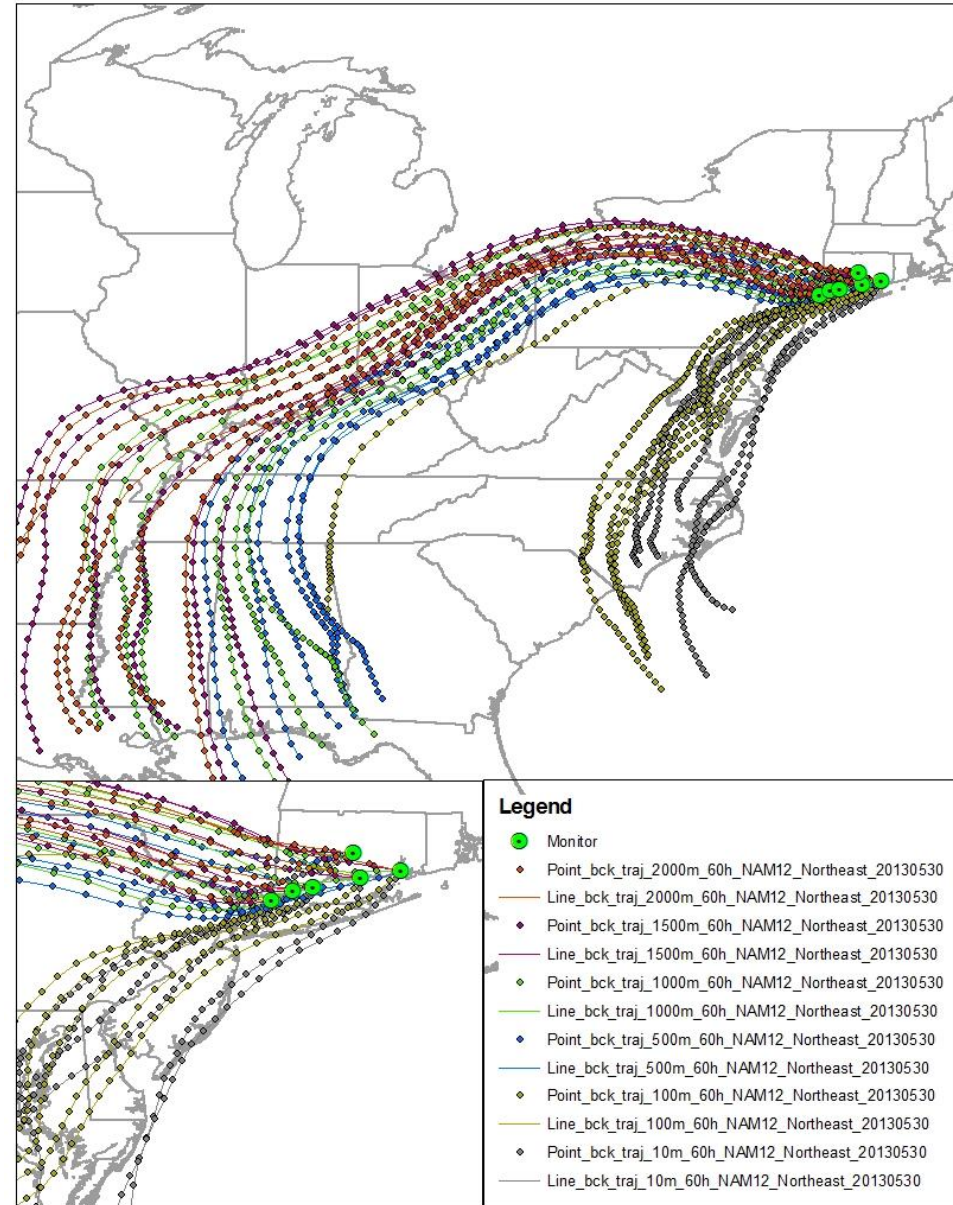
- Exceeding monitors:
  - Fair Hill MD: 80 PPB
  - Clarksboro NJ: 78 PPB
  - Bristol PA: 77 PPB
- 10m trajectories near NC Coast 5/27/13, near Richmond VA 5/28/13.
  - 8-hour values in the mid-50s @ Castle Hayne & Beaufort 5/27/13.
  - Norfolk VA area 8-hour near 50 PPB 5/28/13.
  - Richmond VA area 8-hour in the 40s 5/28/13.
- 500m trajectories through TN, southern KY 5/28/13.
  - 8-hour values in the lower 50s, 5/28/13.
- 1-hour 90 PPB value @ Fair Hill MD 1PM EST, 80+ PPB spread NE into greater PHL area through the rest of the afternoon.
- No NC impact observed.



# 5/30/2013

Slide 41

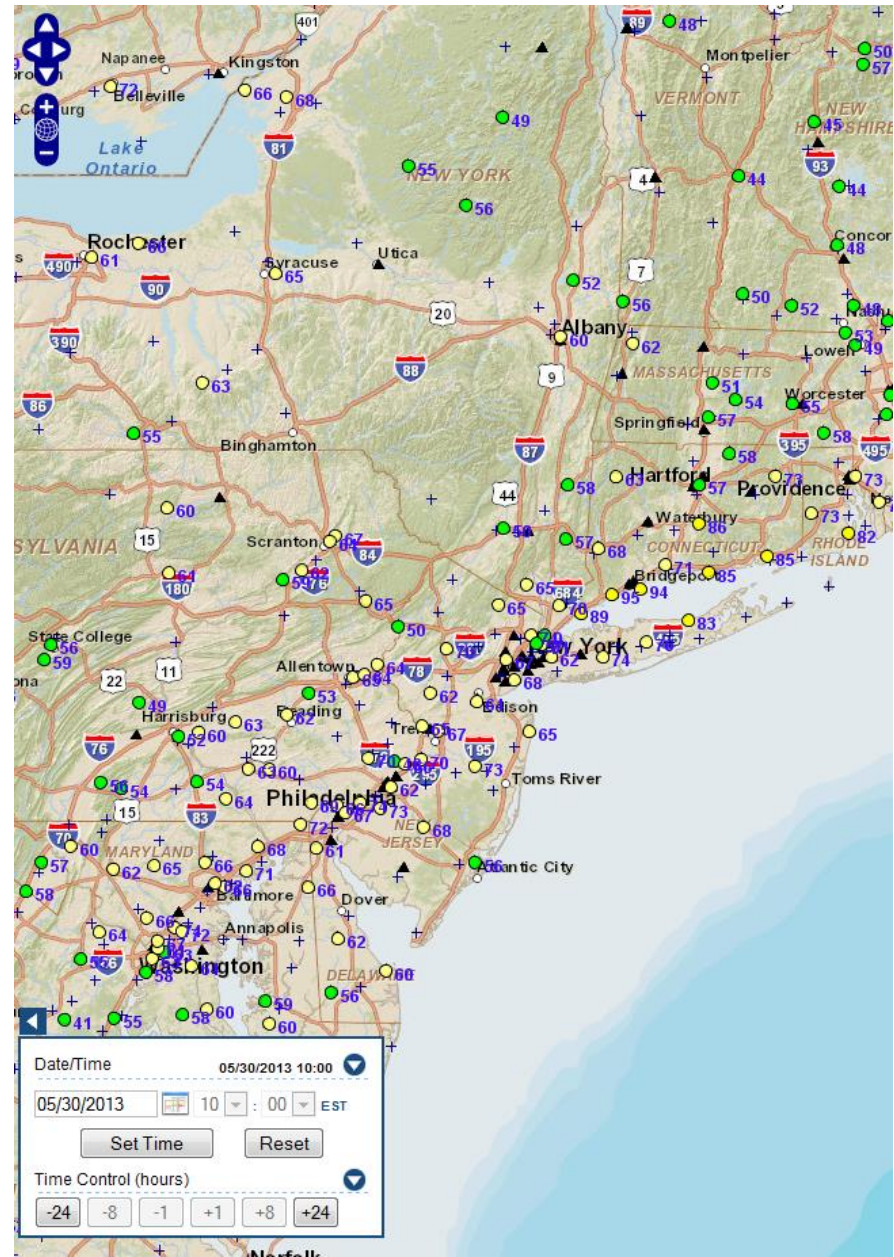
- Exceeding monitors:
  - Westport CT: 95 PPB
  - Stratford CT: 94 PPB
  - Greenwich CT: 89 PPB
  - Middletown CT: 86 PPB
  - Madison CT: 85 PPB
  - Groton CT: 85 PPB
- 10/100m trajectories
  - Through central & eastern NC 5/28/13.
    - Eastern NC monitors 8-hour 49-54 PPB.
  - Through the greater PHL area 5/29/13.
    - 8-hour ozone values to 80 PPB (see 5/29/13 case).
- 500/1000/1500/2000m trajectories through OH Valley 5/29/13.
  - General 8-hour ozone values in the 50s and 60s, localized to 71 PPB.
- Little or no NC impact observed.





# 5/30/2013

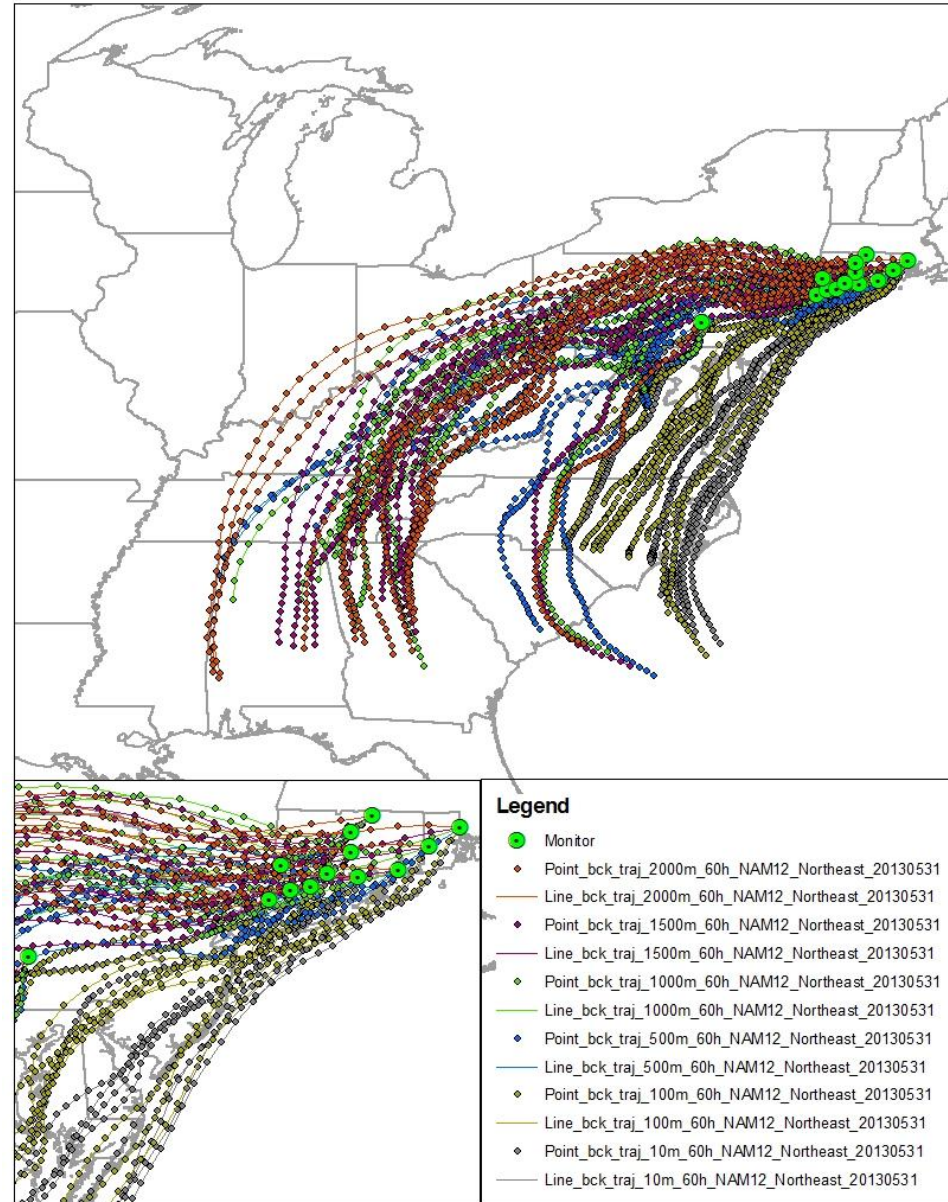
- Exceeding monitors:
  - Westport CT: 95 PPB
  - Stratford CT: 94 PPB
  - Greenwich CT: 89 PPB
  - Middletown CT: 86 PPB
  - Madison CT: 85 PPB
  - Groton CT: 85 PPB
- High values observed along Long Island, 5/30/13.
  - Riverhead NY 8-hour 83 PPB.
- High values observed downwind of NYC along coastal CT. Low values interior CT.



# 5/31/2013

Slide 43

- Exceeding monitors:
  - Stratford CT: 85 PPB
  - Westport CT: 85 PPB
  - Stafford CT: 83 PPB
  - Middletown CT: 82 PPB
  - Madison CT: 81 PPB
  - W. Greenwich RI: 81 PPB
  - Groton CT: 80 PPB
  - Greenwich CT: 79 PPB
  - E. Providence RI: 76 PPB
  - Lebanon PA: 76 PPB
- Day 3 of multi-day ozone outbreak.

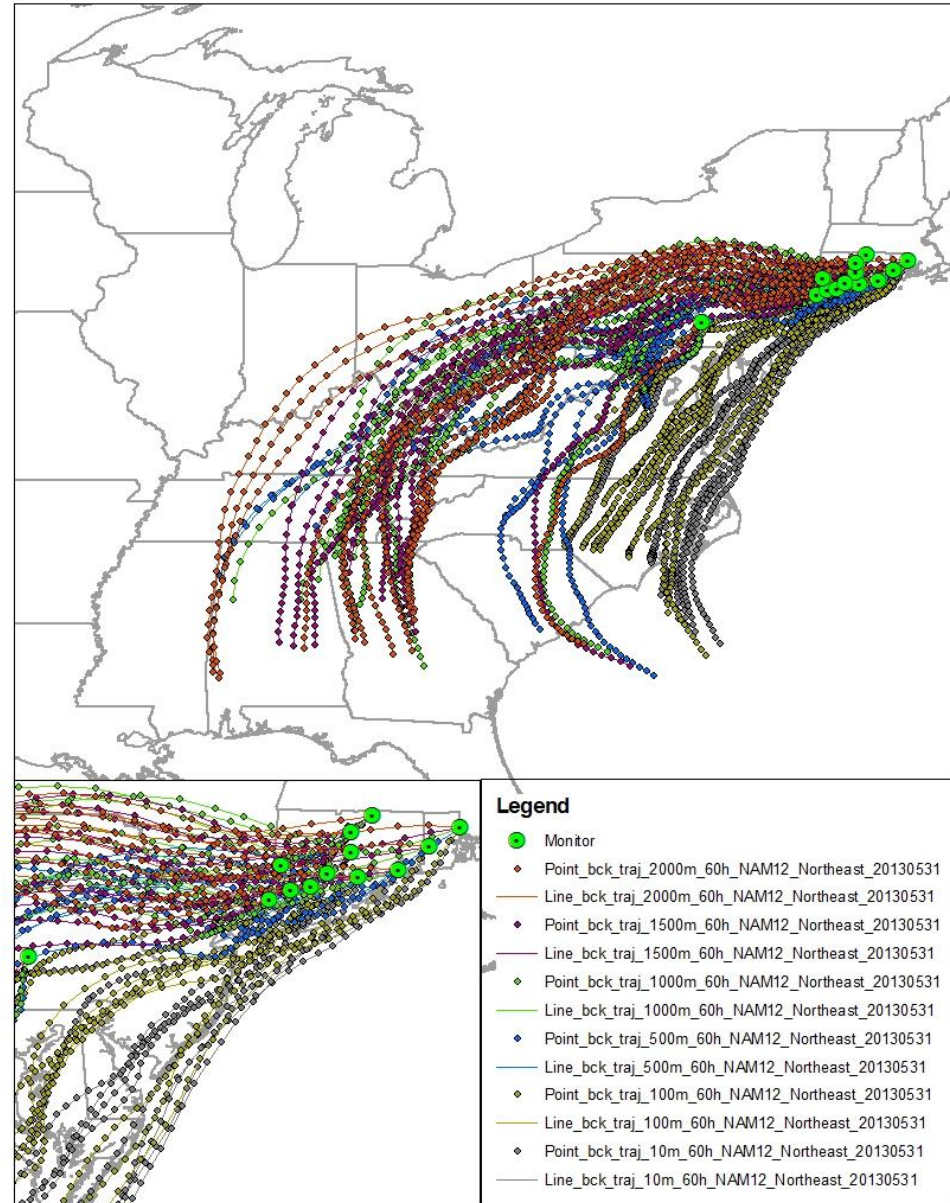




# 5/31/2013

Slide 44

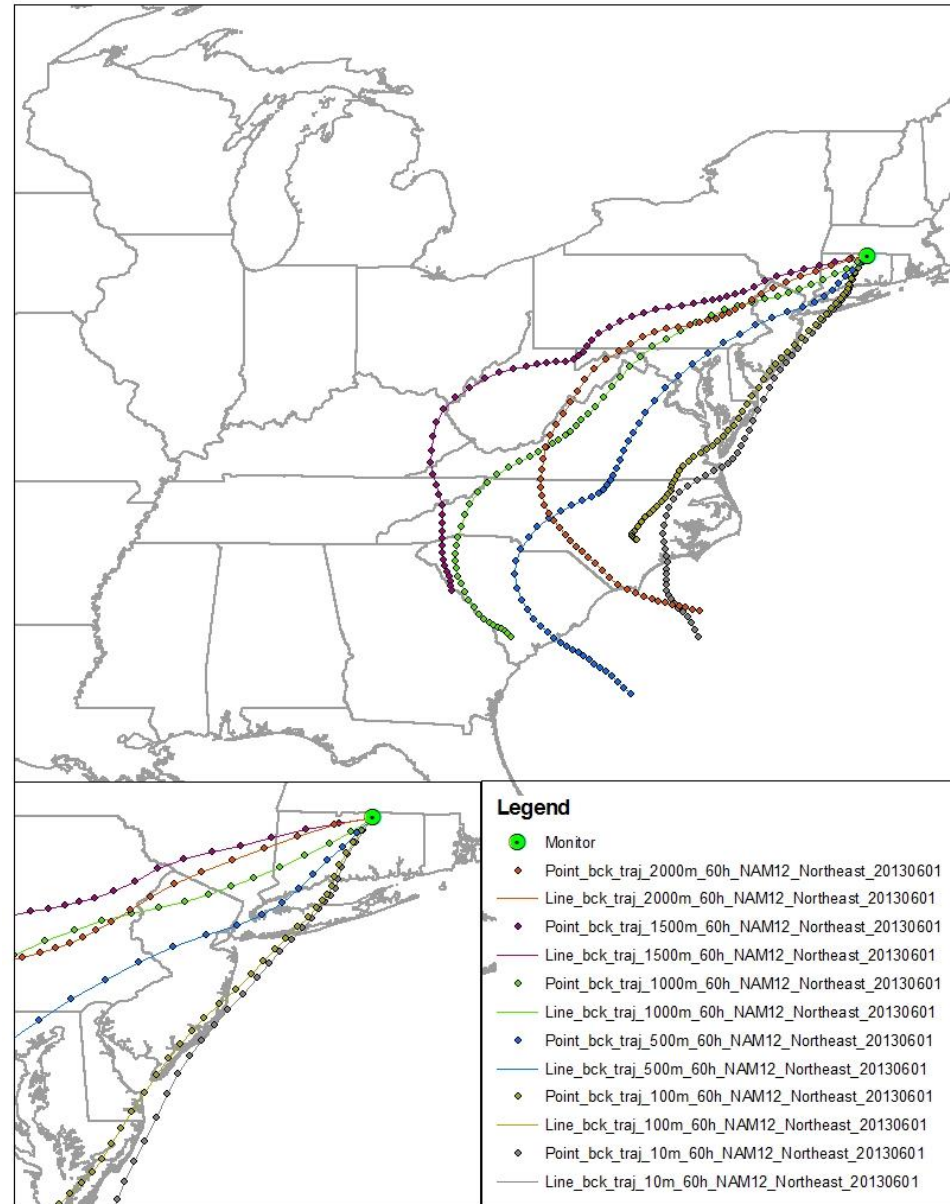
- 10/100m trajectories
  - Across central & eastern NC 5/29/13.
    - Ozone values 8-hour values in the 40s, 5/29/13.
  - DELMARVA 5/30/13
    - 8-hour in the 50s and lower 60s 5/30/13.
- 1000/1500/2000m trajectories through western NC and TN 5/29/13.
  - Through PA 5/30/13, ozone 8-hour values in the 50s and 60s.
- Lebanon PA trajectories
  - Through northern SC 5/29/13.
    - 8-hour ozone values 44 PPB 5/29/13.
  - Through central VA 5/30/13.
    - Central VA 8-hour ozone values 52 PPB 5/30/13.
- Some NC contribution possible.



# 6/1/2013

Slide 45

- Exceeding monitors:
  - Stafford CT: 81 PPB
- 10/100m trajectories
  - Across eastern NC 5/30/13.
    - Jamesville 8-hour 27 PPB.
  - Off NJ coast 5/31/13.
    - Atlantic City 8-hour 52 PPB.
- 500m trajectories across northern NC, 5/31/13.
  - Bushy Fork: 8-hour 31 PPB.
  - Butner: 8-hour 32 PPB.
- 1000m trajectories across western NC 5/30/13-5/31/13.
  - Ozone 8-hour values to 49 PPB N of Greer SC, 5/30/13.
  - Harrisonburg VA, 8-hour 51 PPB 5/31/13.
- High ozone values over 90 PPB build over coastal CT & Danbury CT, move up I-91 towards HFD then NE towards Stafford.
- Little or no NC impact observed.

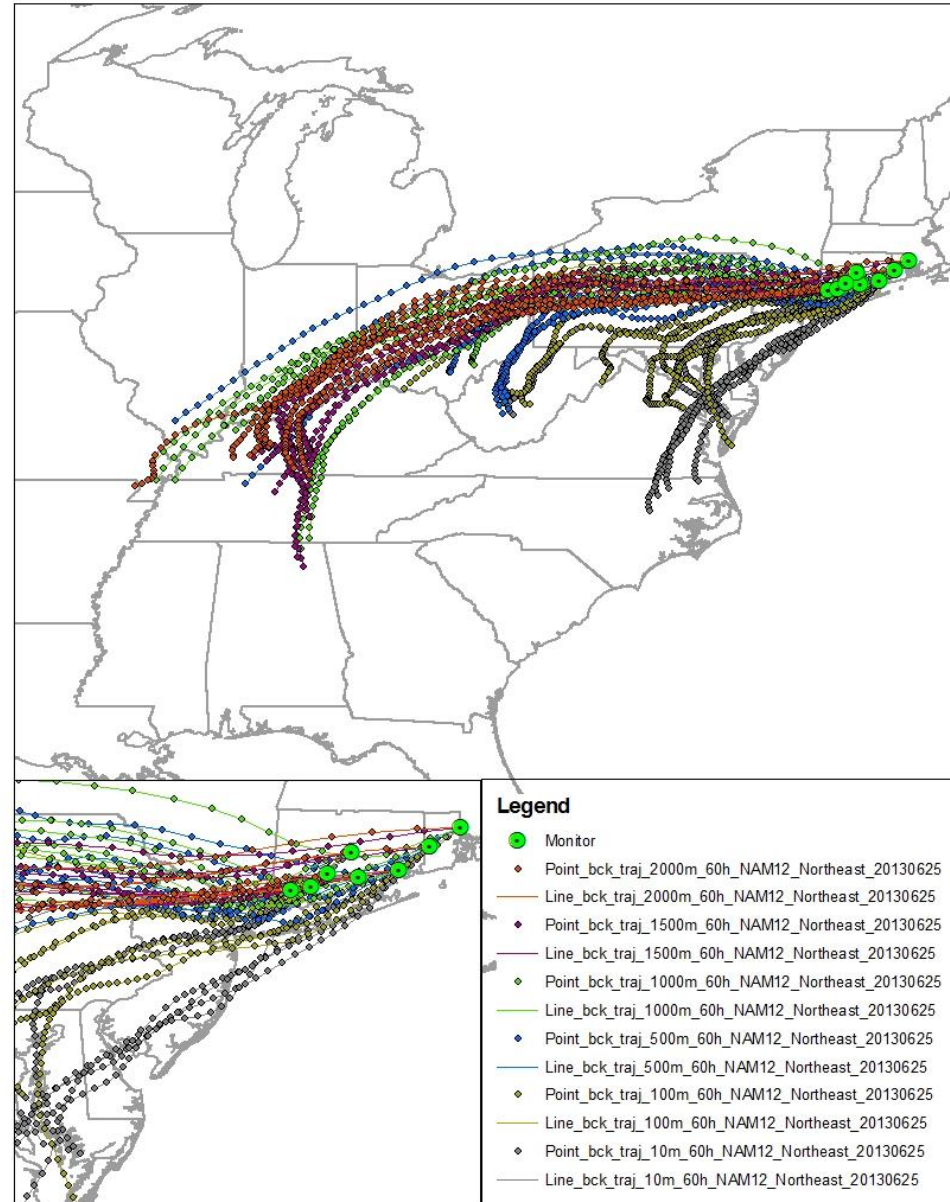




# 6/25/2013

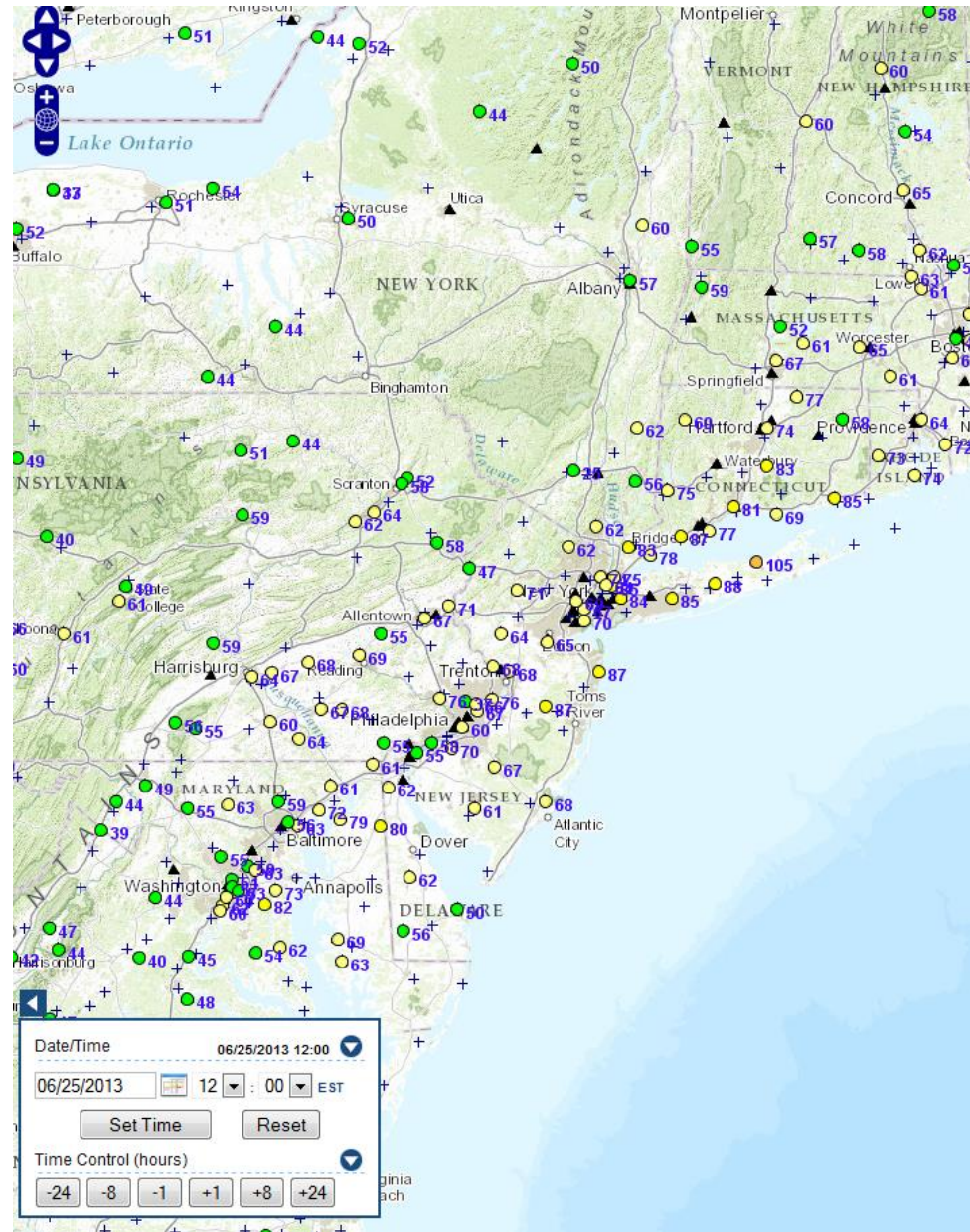
Slide 46

- Exceeding monitors:
  - Middletown CT: 97 PPB
  - Stratford CT: 91 PPB
  - Groton CT: 90 PPB
  - Madison CT: 88 PPB
  - Westport CT: 87 PPB
  - W. Greenwich RI: 83 PPB
  - New Haven CT: 77 PPB
  - E Providence RI: 76 PPB
- 10m trajectories originate over NE NC, early 6/23/13.
  - Richmond VA area, 8-hour values low/mid-20s 6/23/13.
- 1000/1500/2000m trajectories across the OH Valley.
  - NE OH/NW PA 8-hour values in the 50s and 60s, 6/24/13.
  - 8-hour 79 PPB NE of Pittsburgh, 6/24/13.
- No NC impact observed



# 6/25/2013

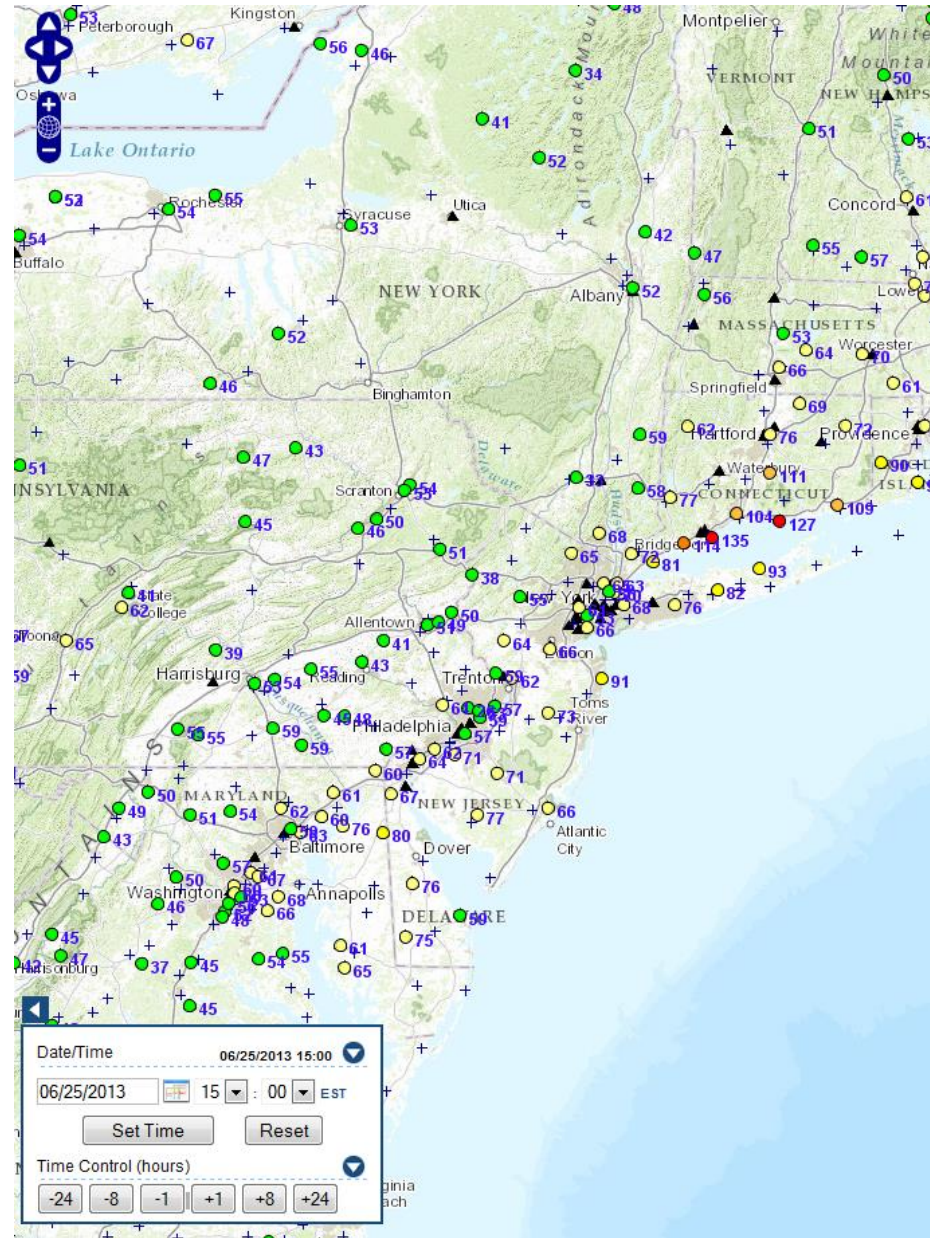
- Exceeding monitors:
  - Middletown CT: 97 PPB
  - Stratford CT: 91 PPB
  - Groton CT: 90 PPB
  - Madison CT: 88 PPB
  - Westport CT: 87 PPB
  - W. Greenwich RI: 83 PPB
  - New Haven CT: 77 PPB
  - E Providence RI: 76 PPB
- High 1-hour ozone values across LI midday 6/25/13, 105 PPB @ Riverhead NY 12PM EST.
- Afternoon hourly ozone values jumped over 130 PPB along CT shore, moved inland.





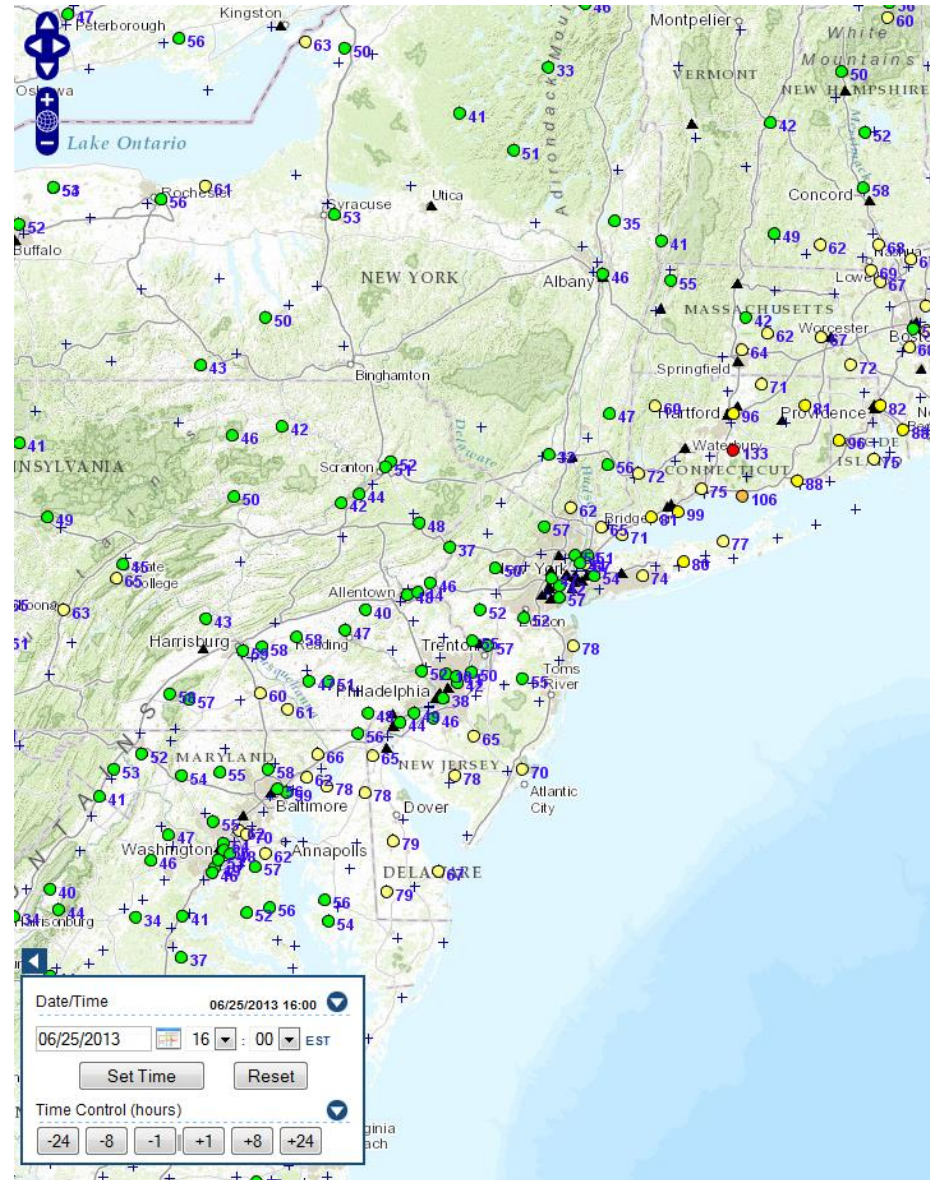
# 6/25/2013

- Exceeding monitors:
  - Middletown CT: 97 PPB
  - Stratford CT: 91 PPB
  - Groton CT: 90 PPB
  - Madison CT: 88 PPB
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- High 1-hour ozone values across LI midday 6/25/13, 105 PPB @ Riverhead NY 12PM EST.
- Afternoon hourly ozone values jumped over 130 PPB along CT shore, moved inland to Middletown & W. Greenwich.

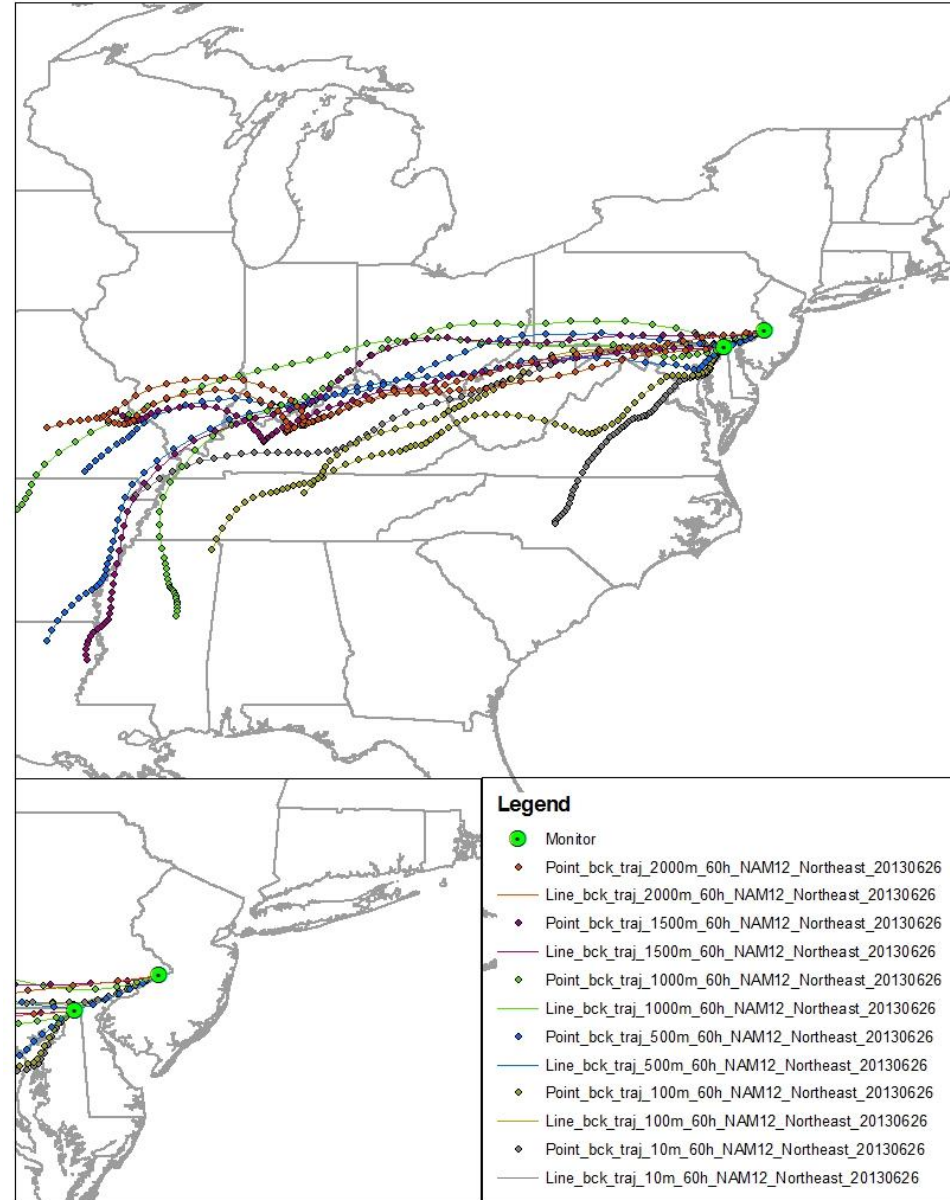




# 6/26/2013

Slide 50

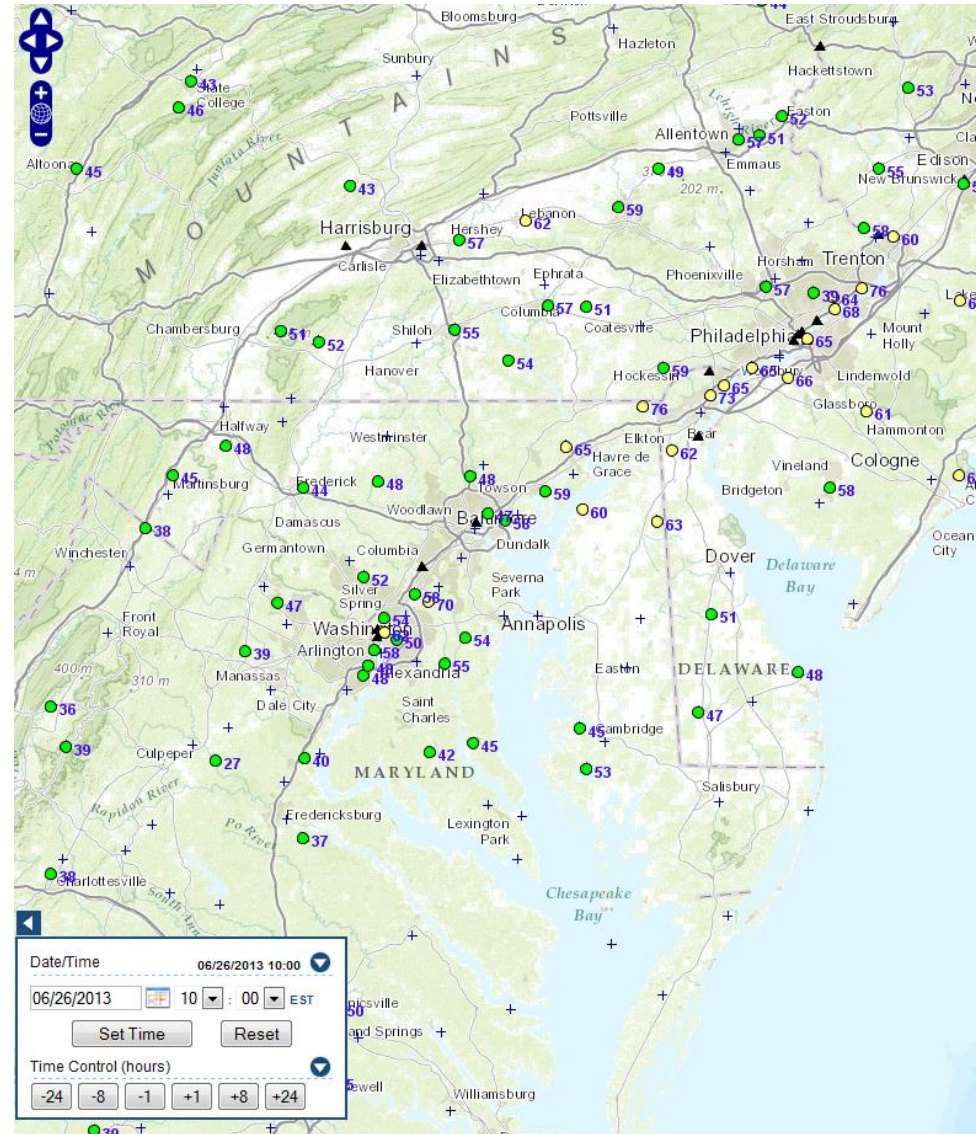
- Exceeding monitors:
  - Fair Hill MD: 76 PPB
  - Bristol PA: 76 PPB
- Fair Hill 10m trajectory
  - Move across north-central NC 6/24/13.
    - Cherry Grove 8-hour 34 PPB.
    - Bethany 8-hour 41 PPB.
    - Mendenhall 8-hour 40 PPB.
  - Northern VA, 6/25/13.
    - Widewater VA 8-hour 44 PPB.
- Thunderstorms across central MD 6/26/13, lower O3 values there.
- Little or no NC impact observed, pollution localized to eastern MD due to rainfall.





# 6/26/2013

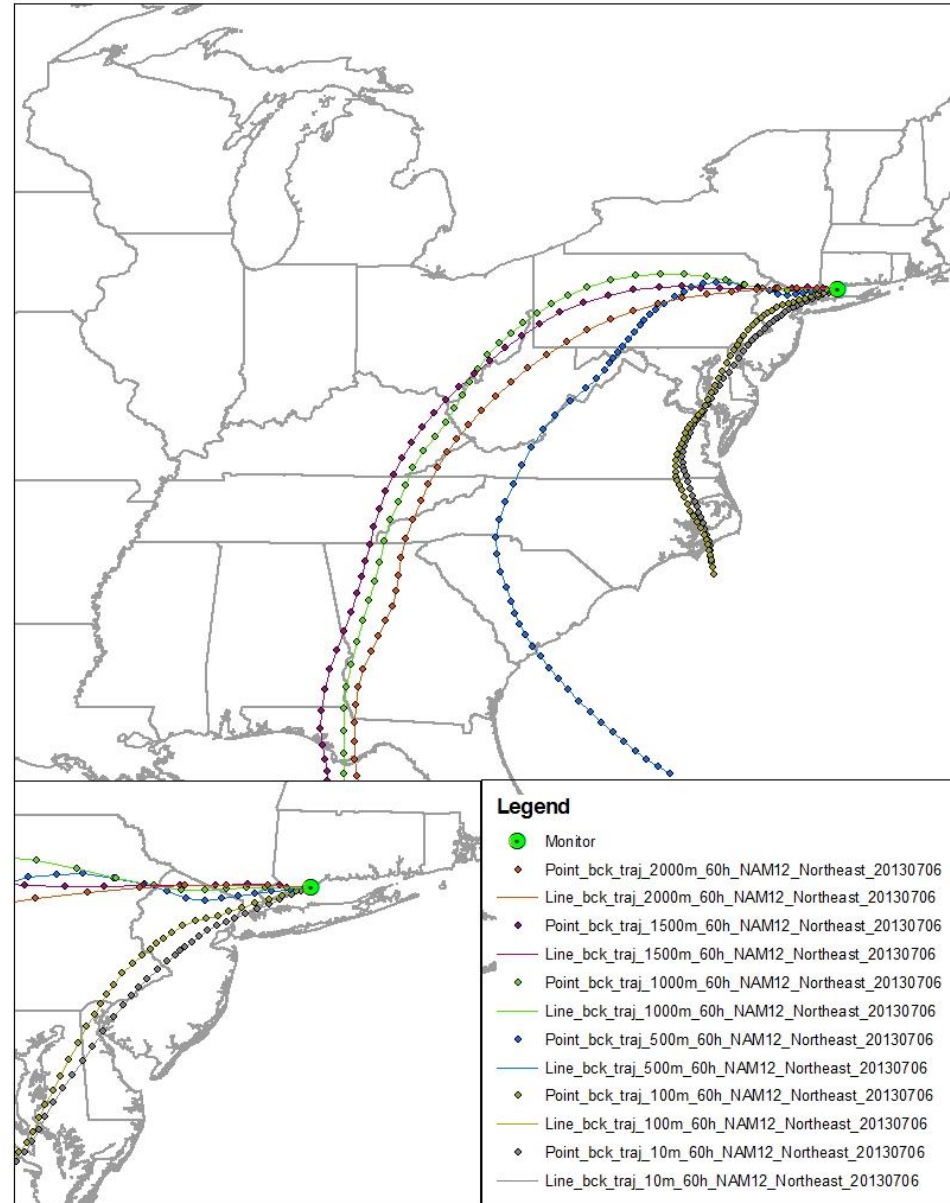
- Exceeding monitors:
  - Fair Hill MD: 76 PPB
  - Bristol PA: 76 PPB
- Fair Hill 10m trajectory
  - Move across north-central NC 6/24/13.
    - Cherry Grove 8-hour 34 PPB.
    - Bethany 8-hour 41 PPB.
    - Mendenhall 8-hour 40 PPB.
  - Northern VA, 6/25/13.
    - Widewater VA 8-hour 44 PPB.
- Thunderstorms across central MD 6/26/13, lower O3 values there.
- Little or no NC impact observed, pollution localized to eastern MD due to rainfall.



# 7/6/2013

Slide 52

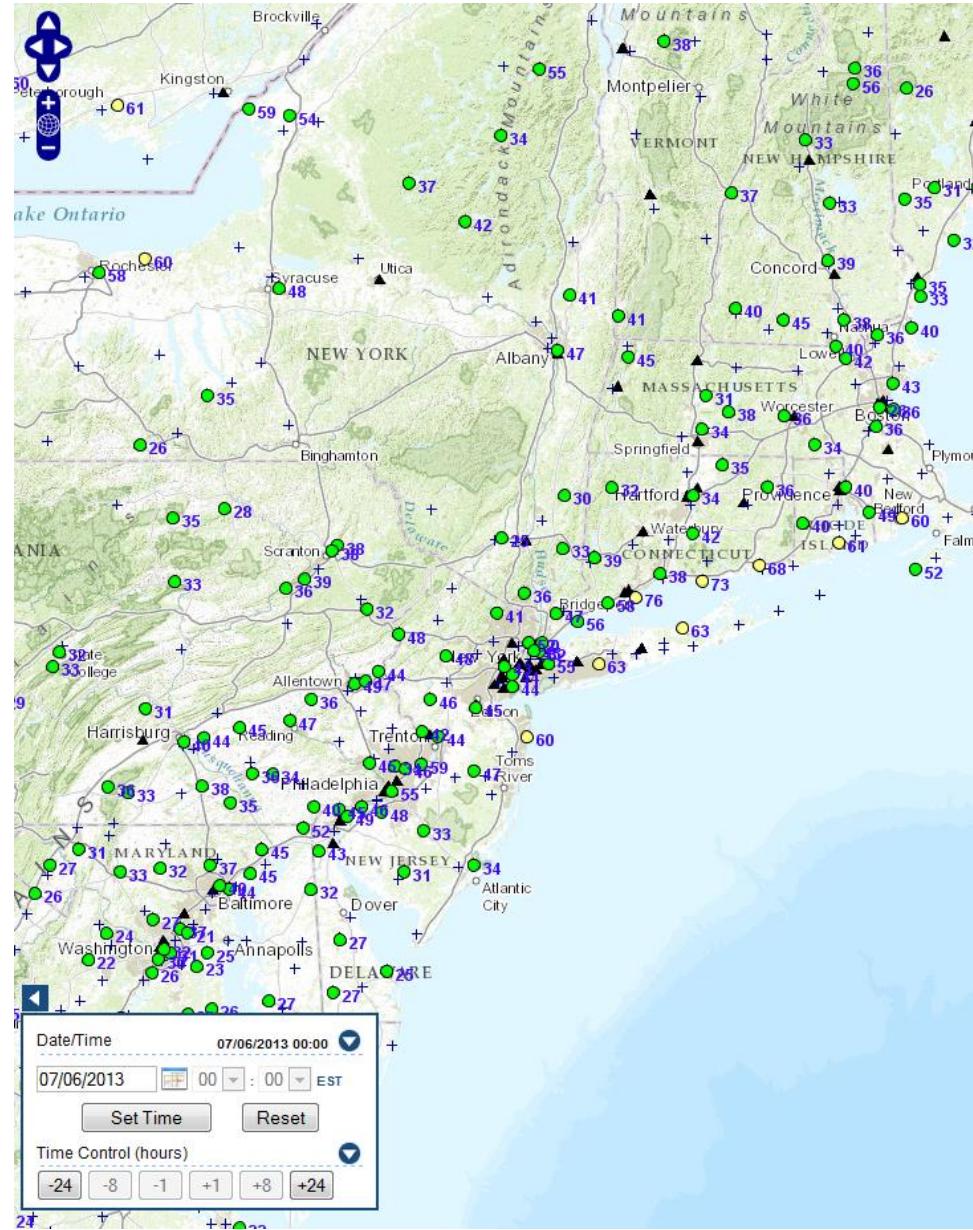
- Exceeding monitors:
  - Stratford CT: 76 PPB
- 10/100m trajectories move across northern Coastal Plain, 7/4/13.
  - Jamesville, 8-hour 12 PPB.
  - Millington MD, 8-hour 24 PPB 7/5/13.
- 500m trajectories move across western Piedmont overnight 7/4/13-7/5/13.
  - Eastern WV/south-central PA: 8-hour low/mid-20s, 7/5/13.
- 1000/1500/2000m trajectories move across Appalachians 7/5/13.
  - NC Valley/Ridge Tops/Eastern TN/SW OH (1000m): Ozone 8-hour mid-teens to mid-20s, 7/5/13.
- Severe ozone gradient E of NYC, interior to coastal CT.
- No NC impacts observed.





# 7/6/2013

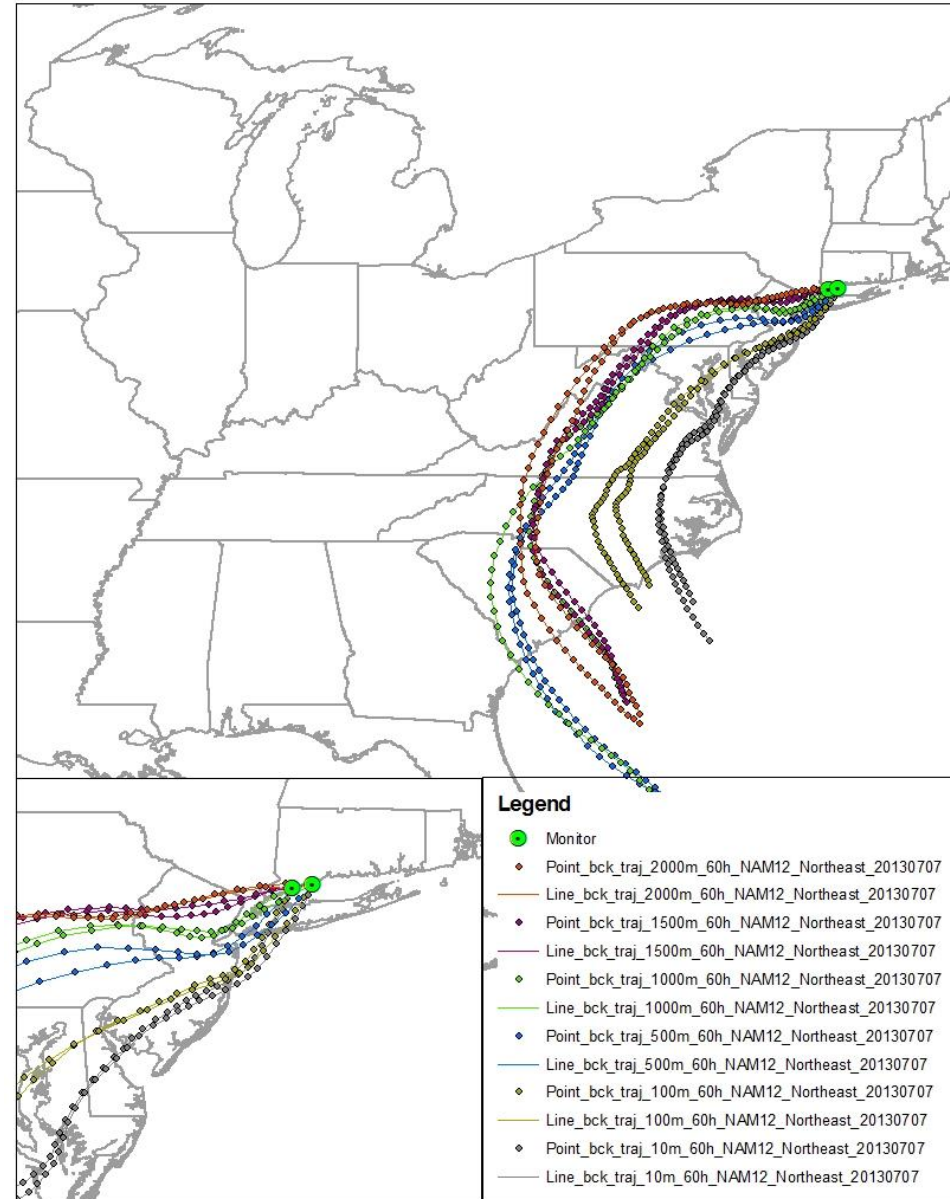
- Exceeding monitors:
  - Stratford CT: 76 PPB
- 10m trajectories move across northern Coastal Plain, 7/4/13.
  - Jamesville, 8-hour 12 PPB.
  - Millington MD, 8-hour 24 PPB 7/5/13.
- 500m trajectories move across western Piedmont overnight 7/4/13-7/5/13.
  - Eastern WV/south-central PA: 8-hour low/mid-20s, 7/5/13.
- 1000/1500/2000m trajectories move across Appalachians 7/5/13.
  - NC Valley/Ridge Tops/Eastern TN/SW OH (1000m): Ozone 8-hour mid-teens to mid-20s, 7/5/13.
- Severe ozone gradient E of NYC, interior to coastal CT.
- No NC impacts observed.



# 7/7/2013

Slide 54

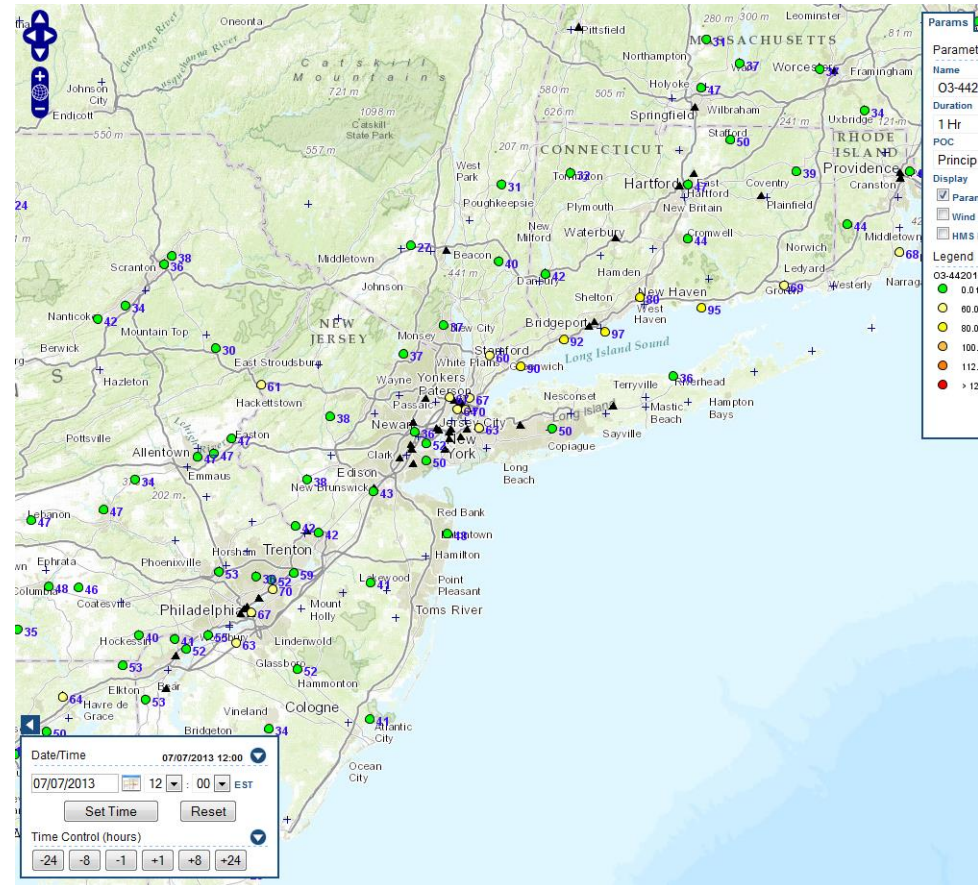
- Exceeding monitors:
  - Westport CT: 81 PPB
  - Stratford CT: 77 PPB
- 500/1000/1500/2000m trajectories moved across I-77 corridor early 7/6/13.
  - Ozone 8-hour values in the 20s along I-81 in western VA, western MD, 30s south-central PA, 7/6/13.
- 10/100m trajectories moved across eastern NC 7/5/13.
  - Ozone 8-hour values 17 to 22 PPB 7/5/13.
  - Ozone 8-hour values in the 20s DELMARVA 7/6/13.
- Severe localized ozone gradient W/E across NYC metro, 7/7/13.
- Additional ozone spikes central coastal CT.
- NC impact to this event unlikely.





# 7/7/2013

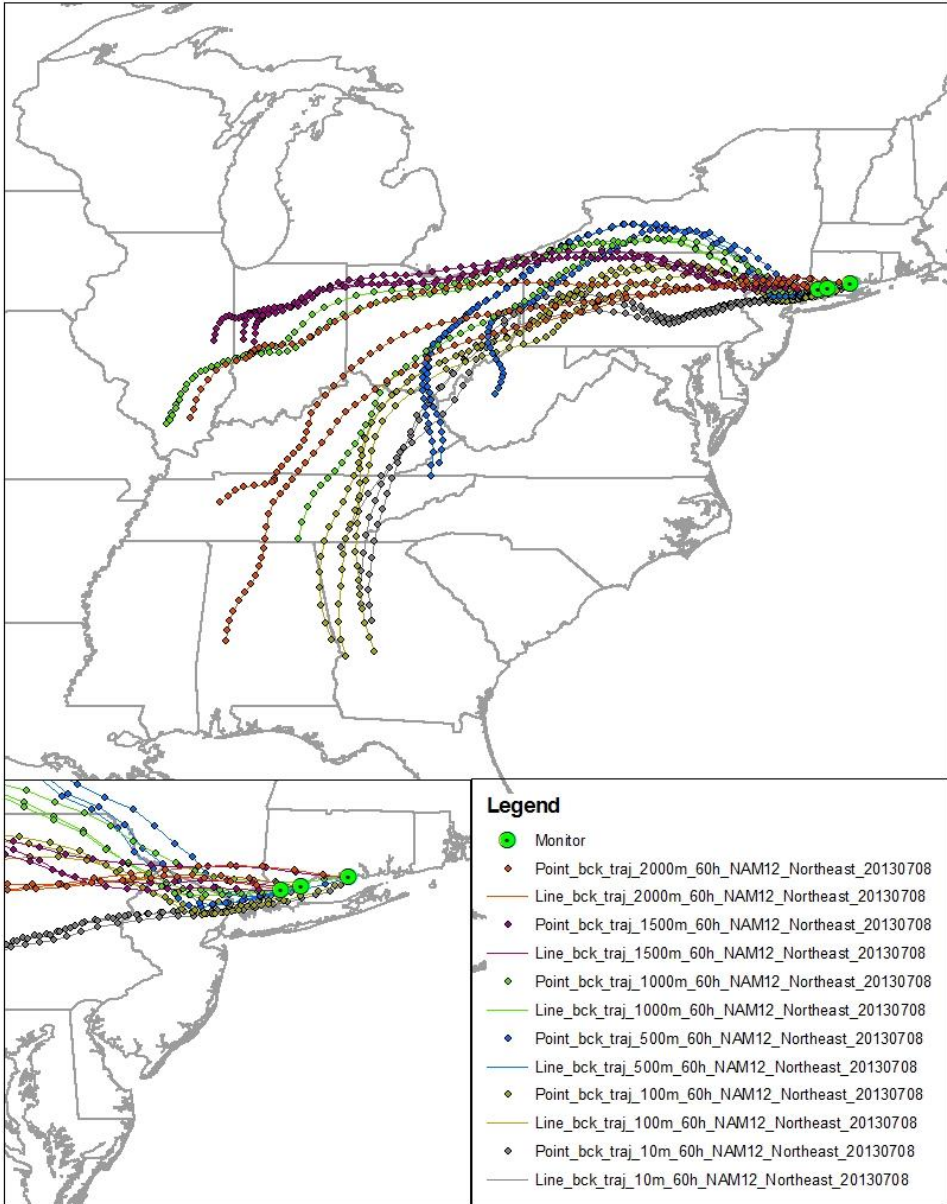
- Exceeding monitors:
  - Westport CT: 81 PPB
  - Stratford CT: 77 PPB
- 500/1000/1500/2000m trajectories moved across I-77 corridor early 7/6/13.
  - Ozone 8-hour values in the 20s along I-81 in western VA, western MD, 30s south-central PA, 7/6/13.
- 10m trajectories moved across NC Coastal Plain 7/5/13.
  - Ozone 8-hour values in the teens 7/5/13.
  - Ozone 8-hour values in the 20s DELMARVA 7/6/13.
- Severe localized ozone gradient W/E across NYC metro, 7/7/13.
- Additional ozone spikes central coastal CT.
- NC impact to this event unlikely.





# 7/8/2013

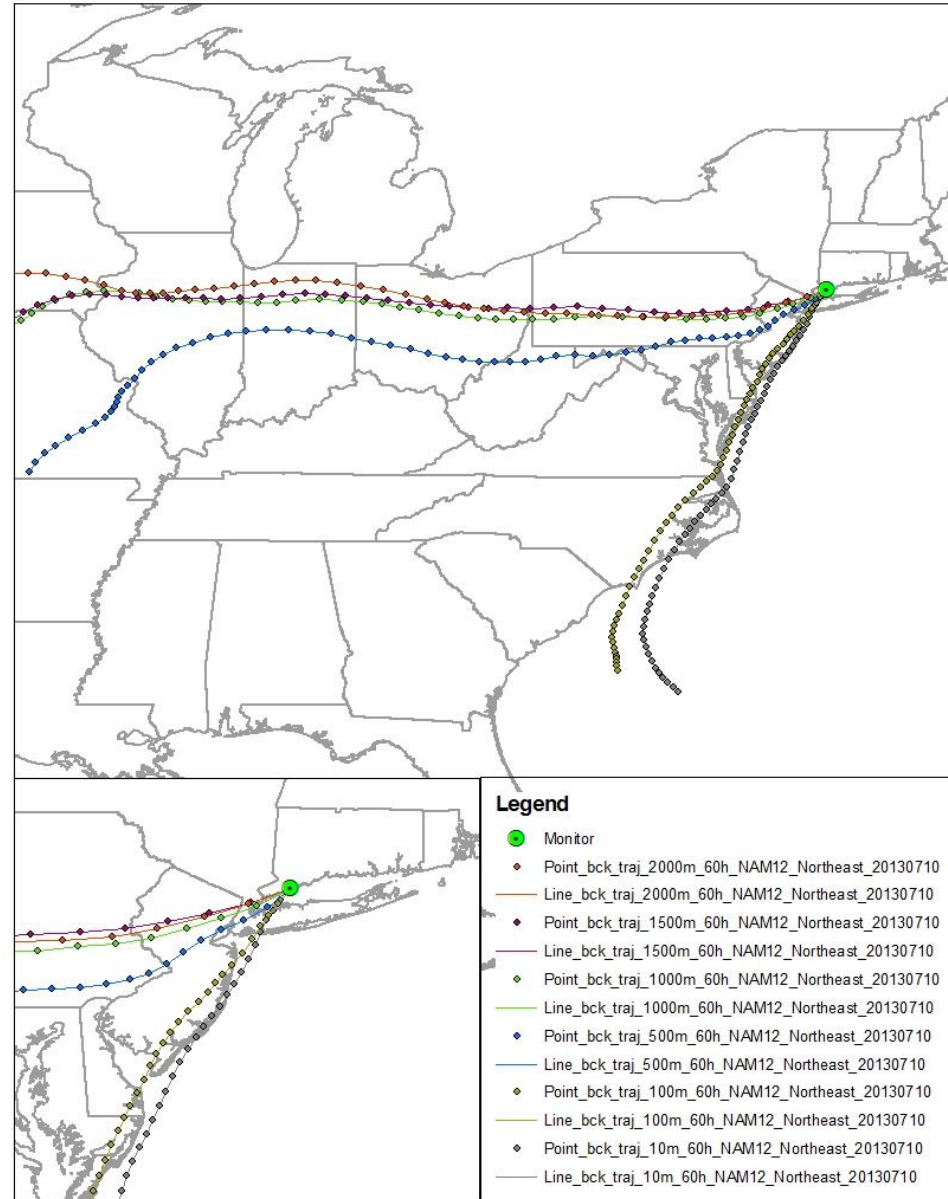
- Exceeding monitors:
  - Stratford CT: 81 PPB
  - Westport CT: 80 PPB
  - Madison CT: 77 PPB
- 10m trajectories moved along NC/TN state line, 7/6/13.
- No NC impact to this event.



# 7/10/2013

Slide 57

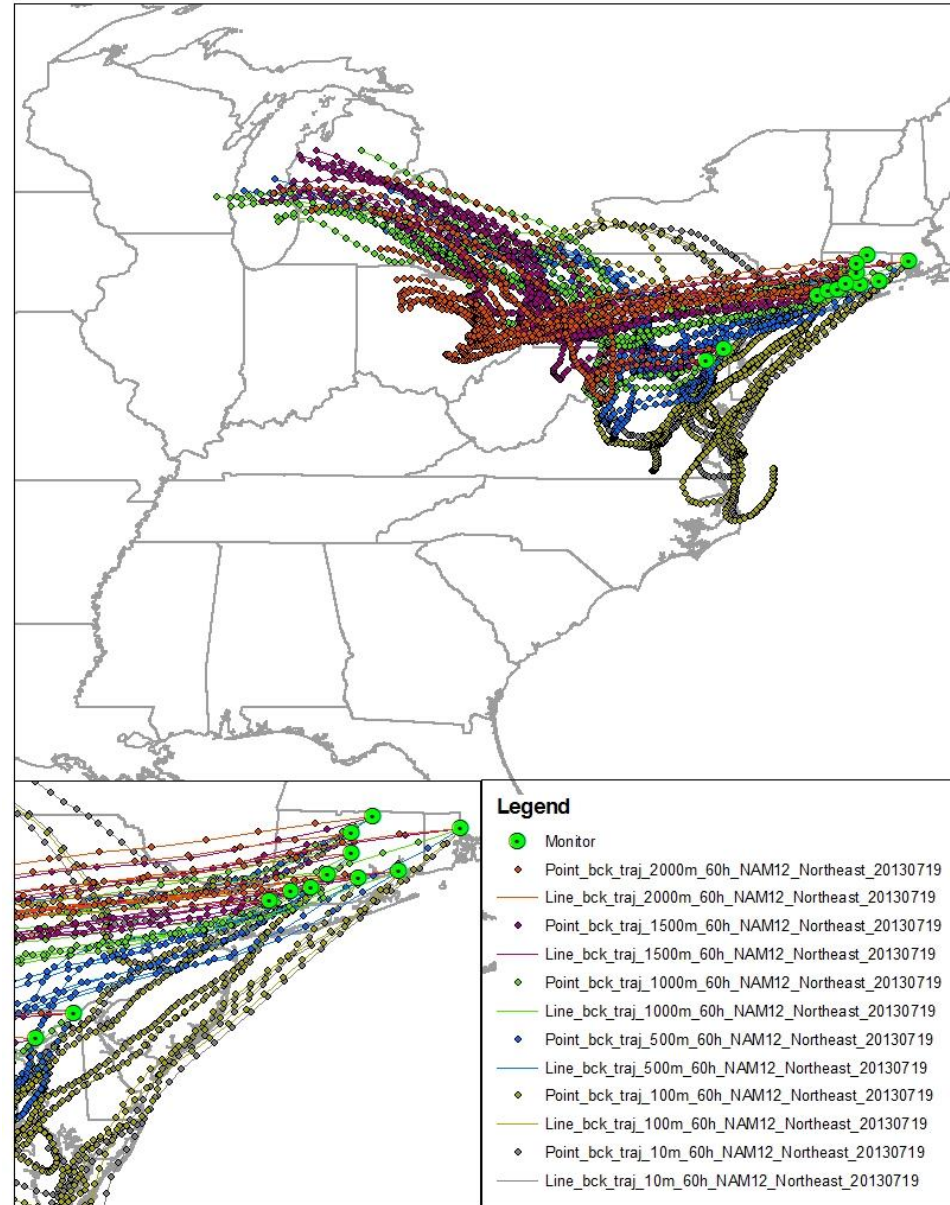
- Exceeding monitors:
  - Westport CT: 76 PPB
- 10/100m trajectories across eastern NC early 7/9/13.
  - Ozone 8-hour values in the 40s over the SE DELMARVA 7/9/13.
- 500m trajectories through N WV 7/9/13.
  - Ozone 8-hour upper 30s.
- 1000/1500/2000m trajectories across N IN/NW OH 7/9/13.
  - Ozone 8-hour upper 30s/40s.
- Localized impacts to W coastal CT, 7/10/13.
  - Cornwall CT: 8-hour 50 PPB
  - New Haven CT: 8-hour 57 PPB
  - Westport CT: 1-hour spikes into the 80s PPB, 12-2PM 7/10/13.
- No NC impact to this event.



# 7/19/2013

Slide 58

- Exceeding monitors:
  - Westport CT: 99 PPB
  - Groton CT: 91 PPB
  - Stratford CT: 90 PPB
  - Middletown CT: 85 PPB
  - Fair Hill MD: 83 PPB
  - Greenwich CT: 82 PPB
  - E. Providence RI: 80 PPB
  - Stafford CT: 79 PPB
  - Madison CT: 79 PPB
  - Edgewood MD: 78 PPB
- 10/100m trajectories moved along northern NC coastline 7/17/13-7/18/13.
- No NC impact to this event.

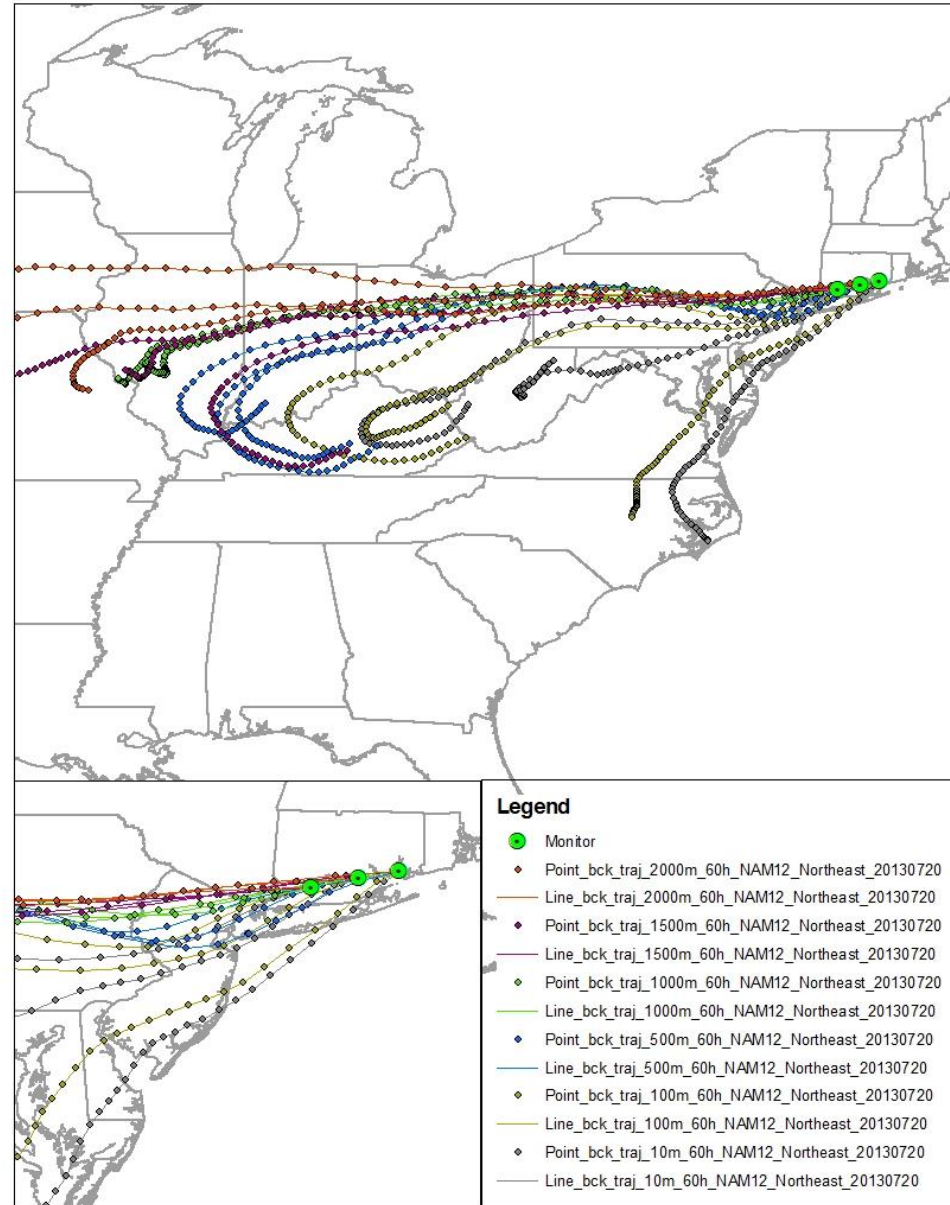




# 7/20/2013

Slide 59

- Exceeding monitors:
  - Groton CT: 83 PPB
  - Stratford CT: 81 PPB
  - Madison CT: 79 PPB
- 10/100m trajectory moves across eastern NC at ground level, 7/18/13, southern DE 7/19/13.
  - Max. 8 hour 50 to 64 PPB 7/18/13 across eastern NC.
  - Seaford DE 8-hour 60 PPB 7/19/13.
- 500/1000/1500/2000m trajectories across northern NYC suburbs, along I-95 in southern CT 7/20/13.
  - 1-hour ozone values northern CT generally in the 40s and 50s, 7/20/13.
    - Frontal passage and afternoon thunderstorms.
  - 1-hour ozone values southern CT peaked in the 90s/100s PPB, 7/20/13.
- 10m trajectories move NE across LI Sound, 7/20/13.
  - Brief spike in ozone values NE of Groton CT.
    - W Greenwich RI 1-hour 94 PPB, 3PM EDT 7/20/13, 8-hour 71 PPB.

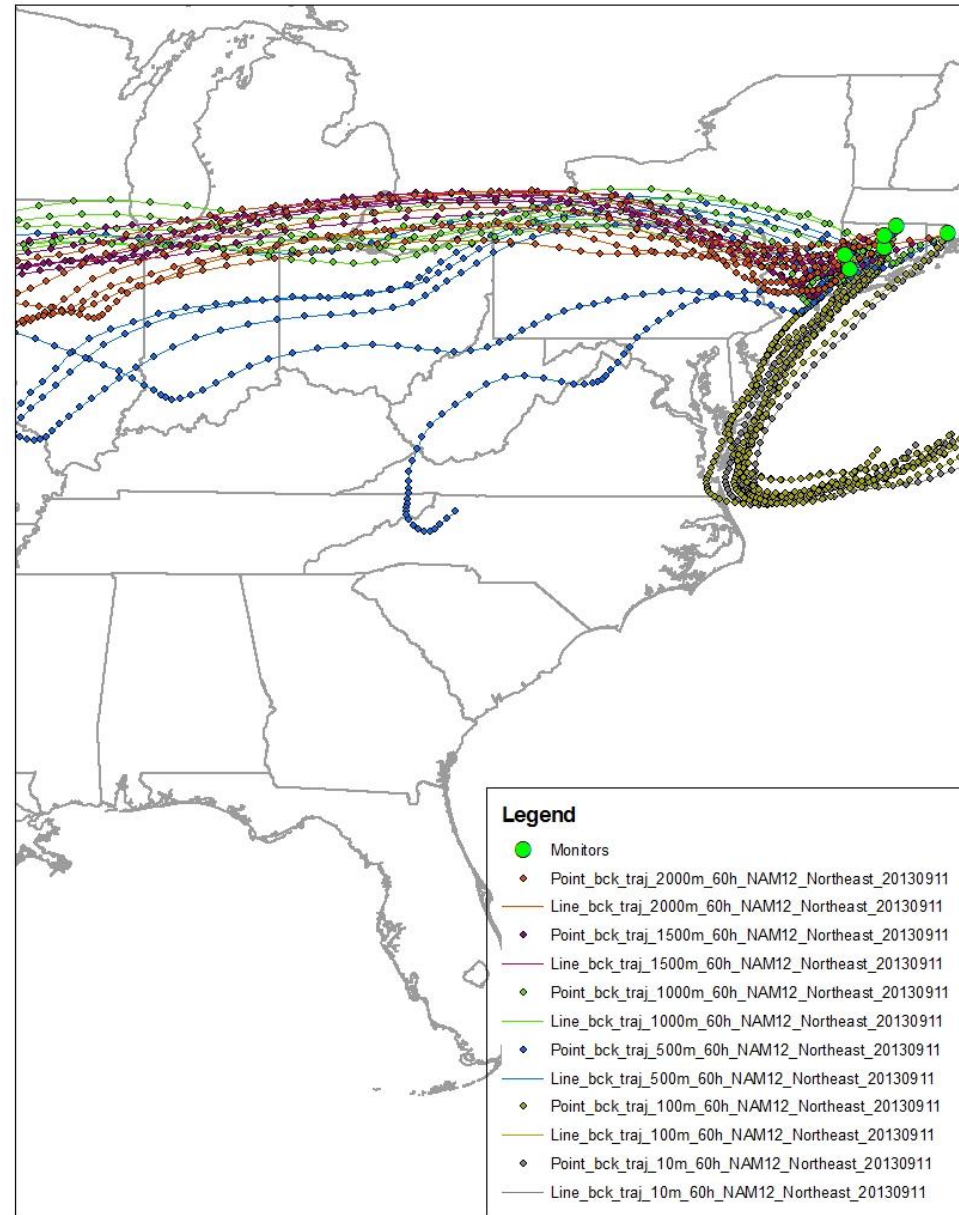




# 9/11/2013

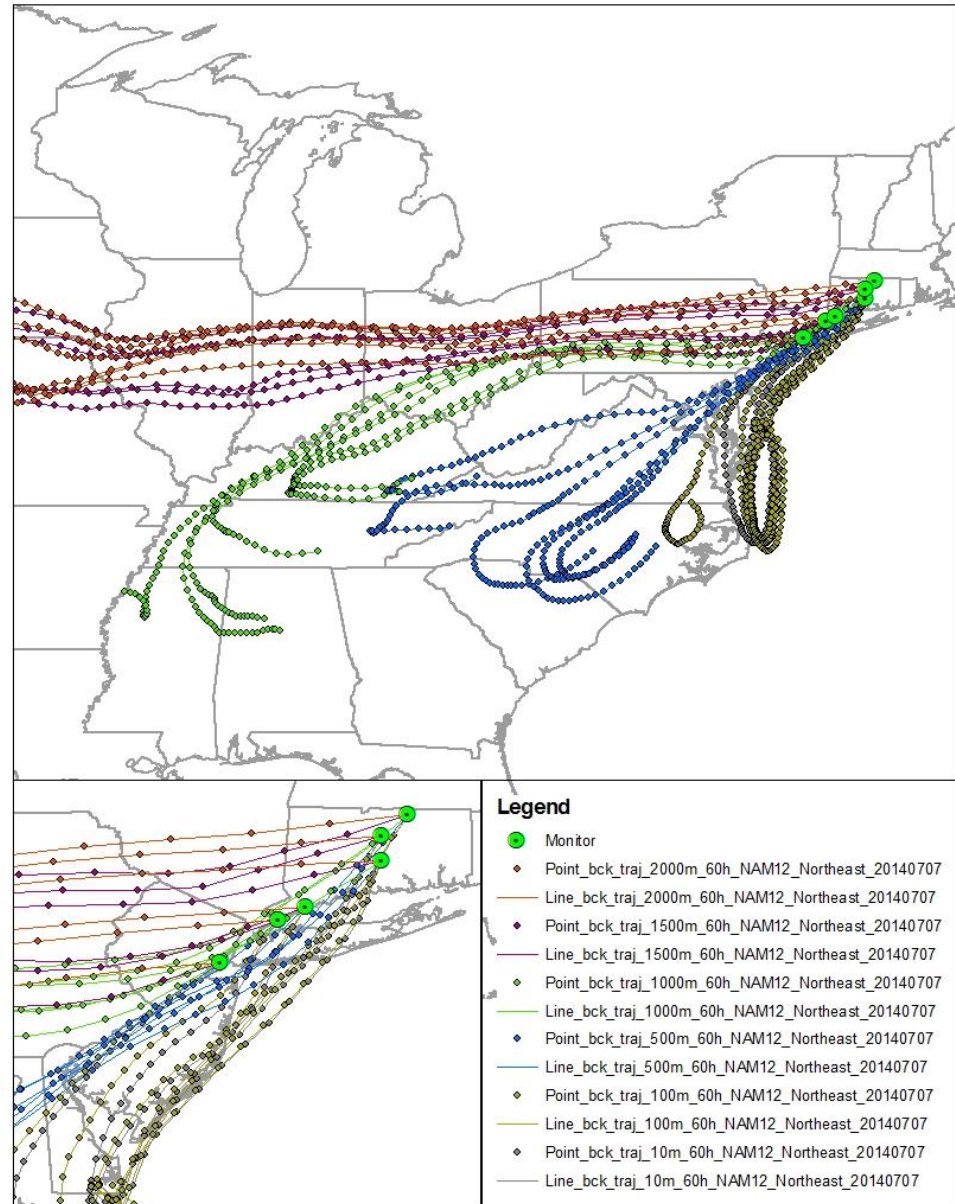
Slide 60

- Exceeding monitor:
  - Westport CT: 79 PPB
- 100m trajectories grazed extreme northeast NC
- 500m trajectories over foothills/mountains
  - Mid 40s ppb observed
- Bulk of trajectories (1000/2000m) where ozone levels much higher
- No impacts from NC.



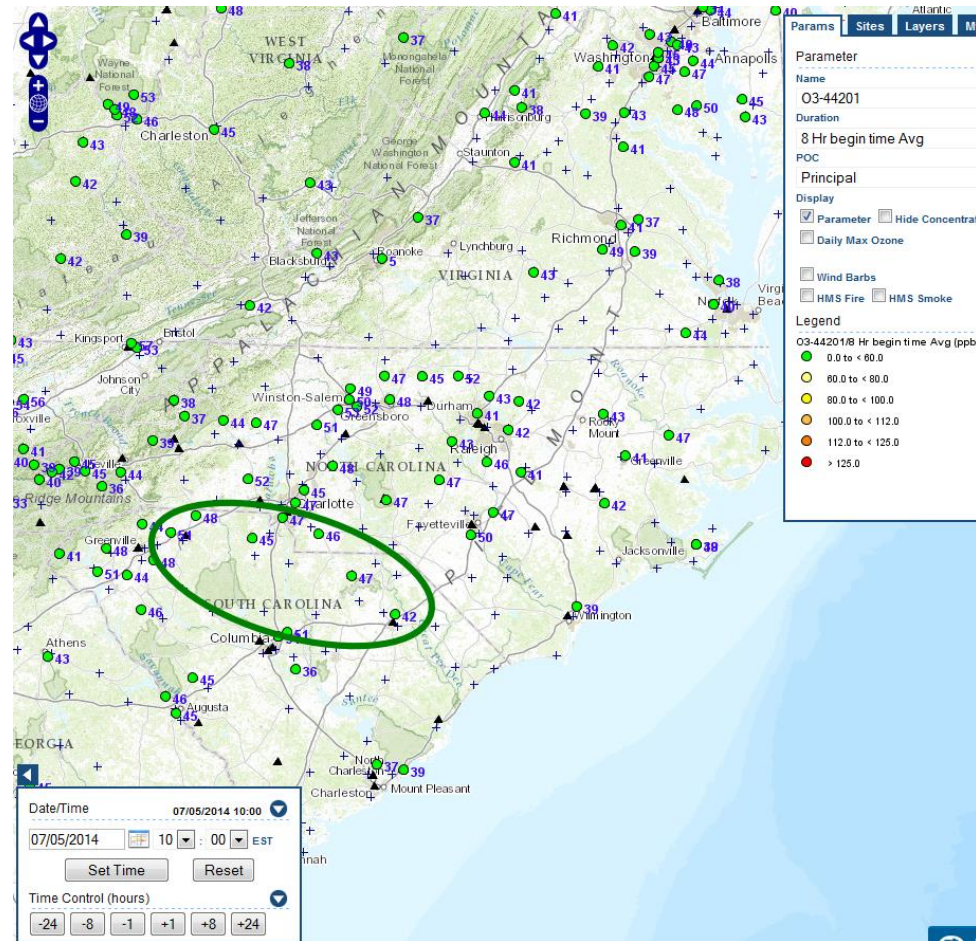
# 7/7/2014

- Exceeding monitors:
  - Greenwich CT: 91 PPB
  - E. Hartford CT: 83 PPB
  - Wagner NY: 83 PPB
  - Stafford CT: 82 PPB
  - Westport CT: 81 PPB
  - Middletown CT: 78 PPB
- Wagner NY 100m trajectory
  - Slowly across NC Coastal Plain 7/5/14.
    - Farmville NC: 41 PPB
  - Across greater Richmond VA Metro 7/6/14.
    - 3 of 4 Richmond monitors 47-49 PPB, fourth (Shirley Plantation) 43 PPB.
- 500m trajectories move across northern SC 7/5/14, northern NC/western VA 7/6/14.
  - Northern SC: 8 hour 42-51 PPB.
  - Northern NC: 8-hour 47-54 PPB.
  - Western VA: 8-hour 51 PPB.
- Generally uniform increase in ozone values across CT with highest values in Westport during midday/afternoon hours 7/7/14
- Some ozone contribution from NC possible.



# 7/7/2014

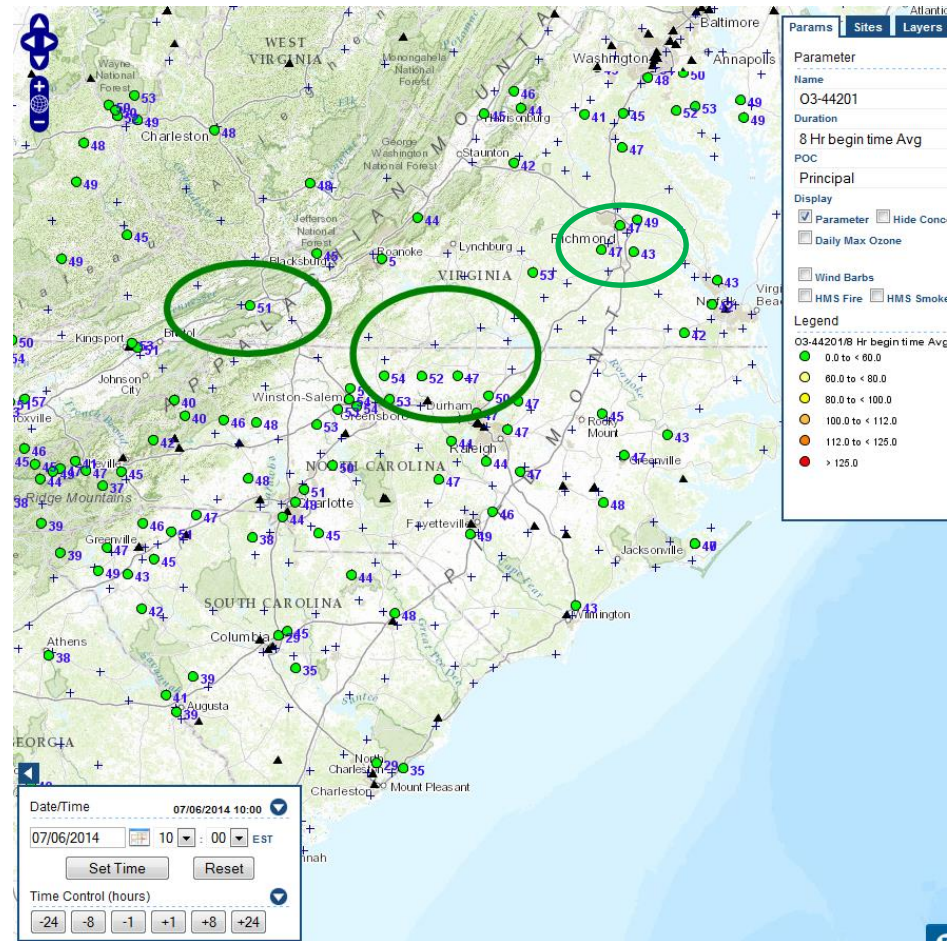
- Exceeding monitors:
  - Greenwich CT: 91 PPB
  - E. Hartford CT: 83 PPB
  - Wagner NY: 83 PPB
  - Stafford CT: 82 PPB
  - Westport CT: 81 PPB
  - Middletown CT: 78 PPB
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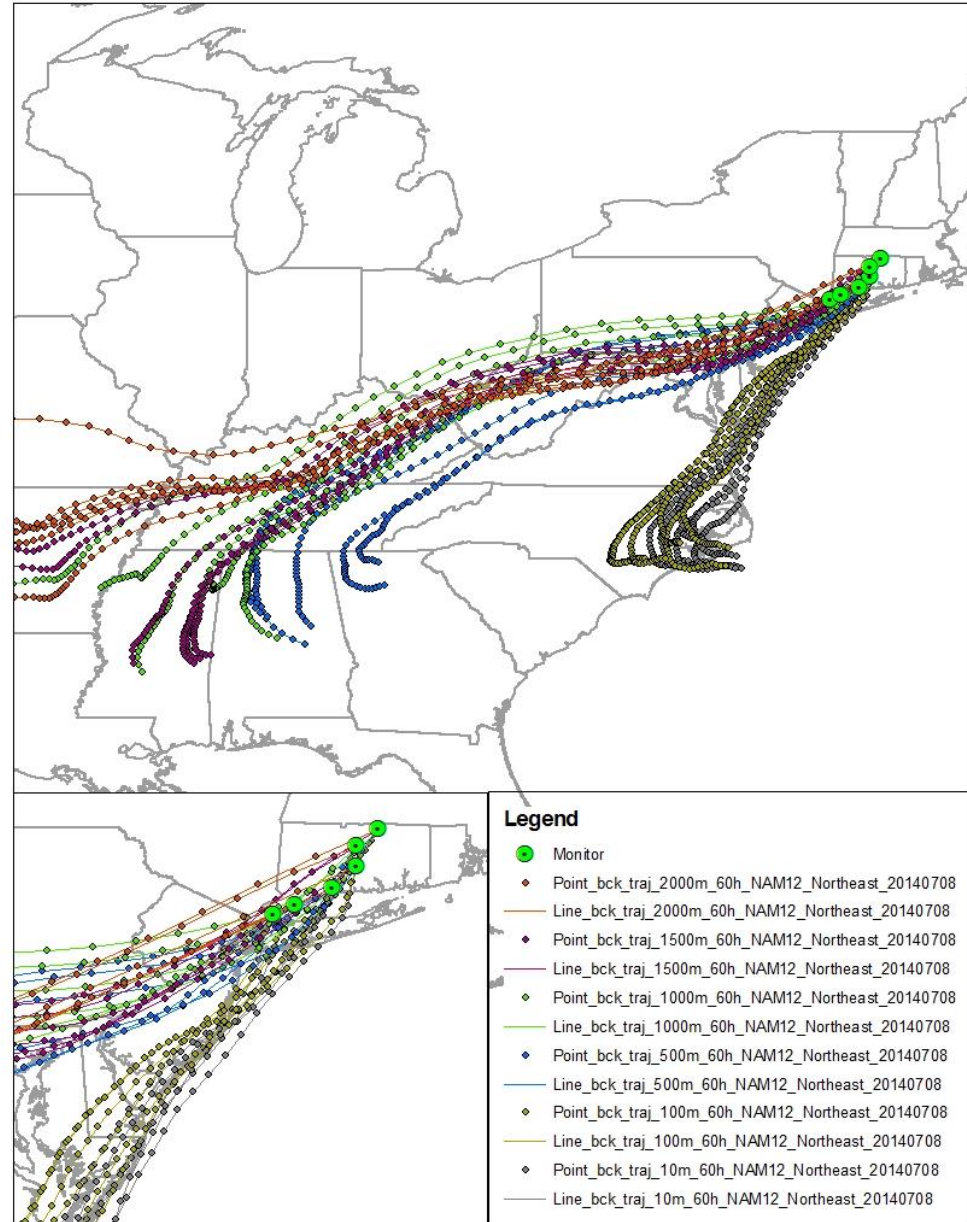
- Exceeding monitors:
  - Greenwich CT: 91 PPB
  - E. Hartford CT: 83 PPB
  - Wagner NY: 83 PPB
  - Stafford CT: 82 PPB
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# 7/8/2014

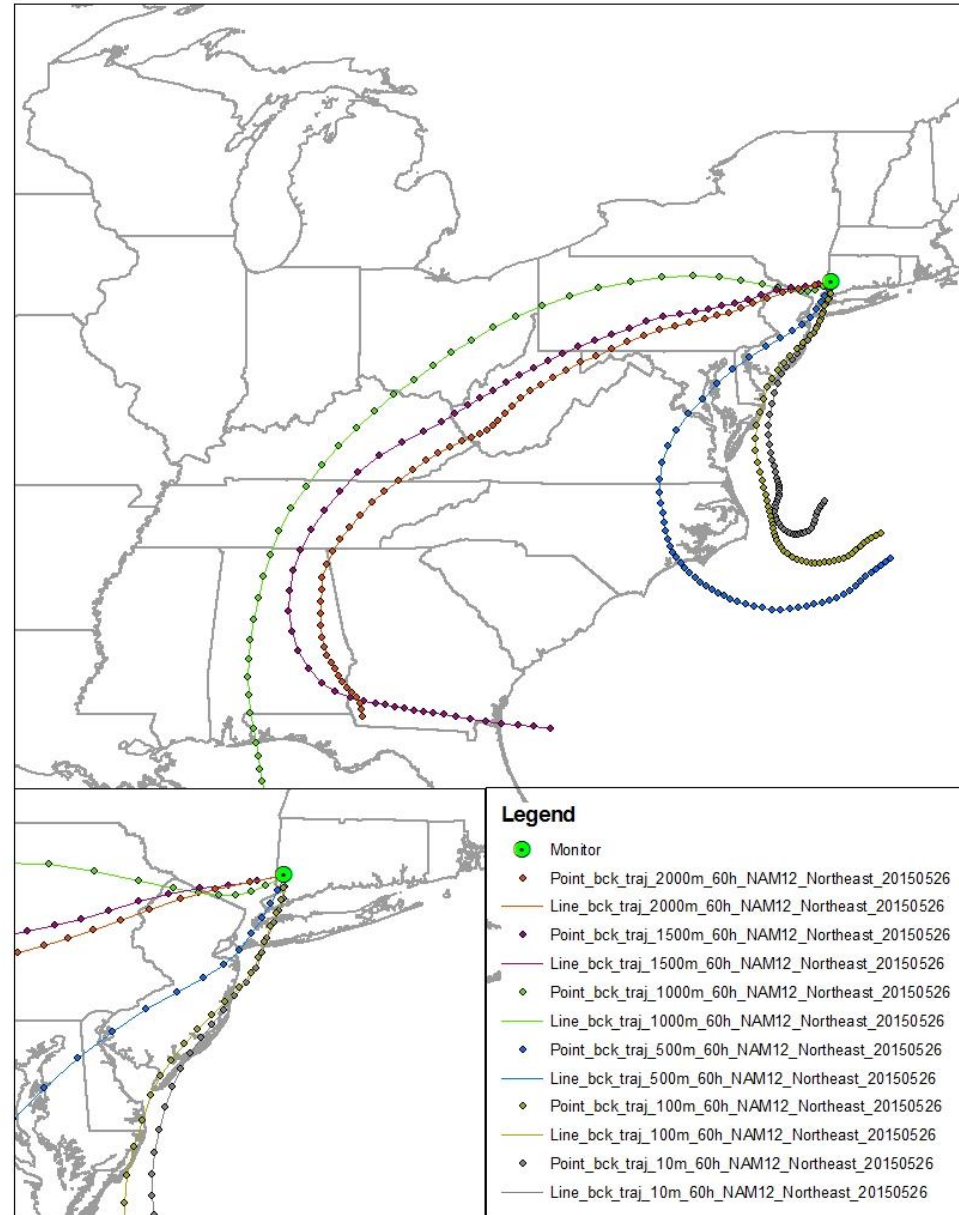
- Exceeding monitors:
  - Westport CT: 82 PPB
  - Middletown CT: 82 PPB
  - Greenwich CT: 78 PPB
  - Stafford CT: 77 PPB
  - E Hartford CT: 77 PPB
  - New Haven CT: 76 PPB
- 10/100m trajectories moved into eastern NC, 7/6/14.
  - 7/6/14: Castle Hayne, Pitt County and Jamesville: 43-48 PPB
  - 7/7/14: Norfolk VA area: mid-40s PPB
- 7/8/2014: Elevated O3 values along 95 corridor from DC through CT.
  - 10/500/1000m trajectories from ~Trenton NJ thru NYC 16Z.
  - Values to 80 PPB NYC, 90-95 PPB coastal CT @ 15Z.
  - High ozone moved from NYC up I-95/I-91 to coastal/interior CT.
- No NC impact to this event.



# 5/26/2015

Slide 65

- Exceeding monitor:
  - Danbury CT: 77 PPB
- 500m trajectory
  - Across eastern NC on 5/25
    - Beaufort NC: 52 PPB
    - Lenoir College NC: 53 PPB
    - Farmville NC: 56 PPB
  - Moved offshore of NE NJ then across NYC, 5/26/15.
    - Monmouth Coll. NJ: 50 PPB.
- No NC impact to this event



# Conclusions

- On days in which exceedances were observed within specific monitors in the Northeast U.S. between 2011-6/15/2015, it is **LIKELY** that North Carolina did not significantly contribute to ozone levels that violated the 75 PPB ozone NAAQS for monitors in the Northeast U.S.
  - Only three of 29 studied days appeared possible where North Carolina appeared to have some contribution.

# Conclusions

- Monitoring data on the vast majority of days in which surface and transport-level winds crossed any portion of North Carolina do not indicate a significant increase in ozone concentrations downwind on proceeding days.
- Trajectory data suggests that air parcels transported into the Northeast U.S. at the 1000-2000m levels on high ozone days are coming principally from the west .
  - 500-meter winds generally more variable in nature than 1-2km winds, but were generally unidirectional with 1-2km winds on days where large numbers of exceedances were observed.
  - 10 and 100-meter winds generally moved across large urban metropolitan areas (e.g., DCA/BWI/PHL/NYC) or heavily-traveled roadways (e.g., I-95, DC/Baltimore highways, NYC-area highways) prior to reaching exceedance sites on days in which exceedances occurred.



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