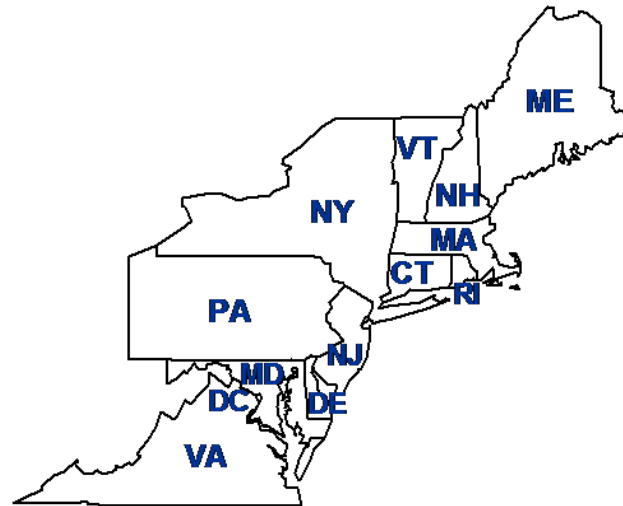


Modeling Committee Update

OTC Fall Committee Meeting



Linthicum, MD
September 8, 2010



OZONE TRANSPORT COMMISSION

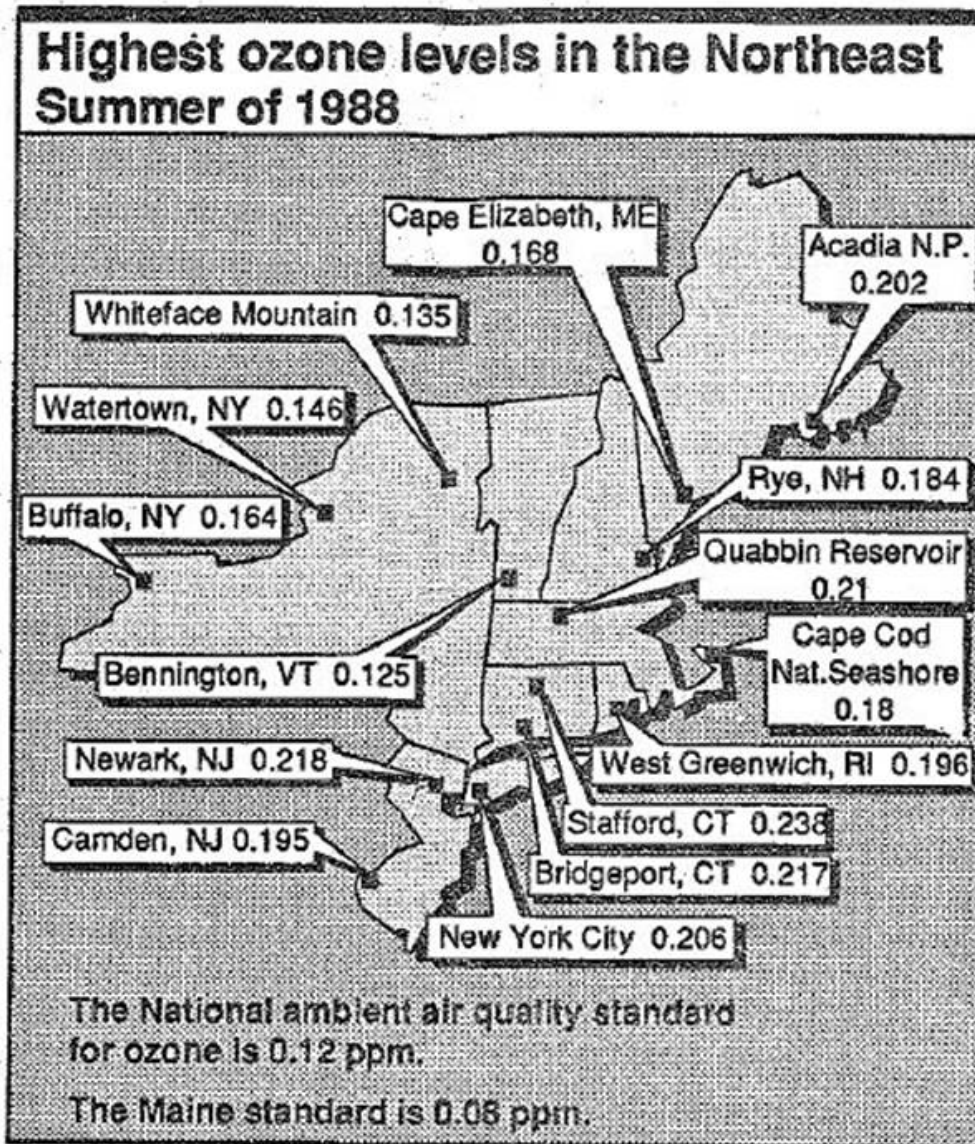
Overview

1. Ozone Season Update
2. Screening Run Status
3. Emissions Inventory Update
 - A. ERTAC Update
 - B. MOVES



1 – OZONE SEASON UPDATE

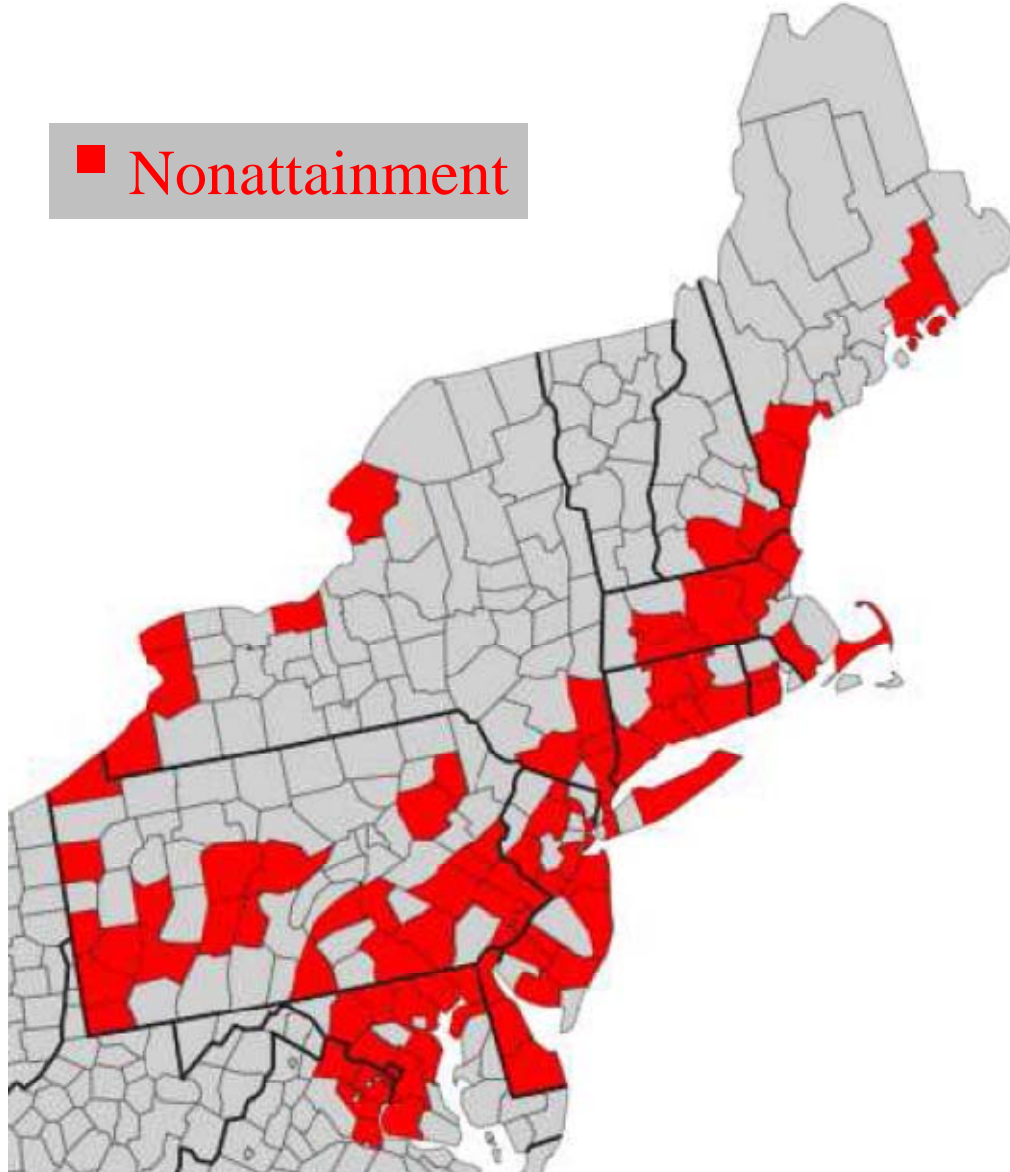
Ozone Levels before CAAA & OTC



Source: NESCAUM

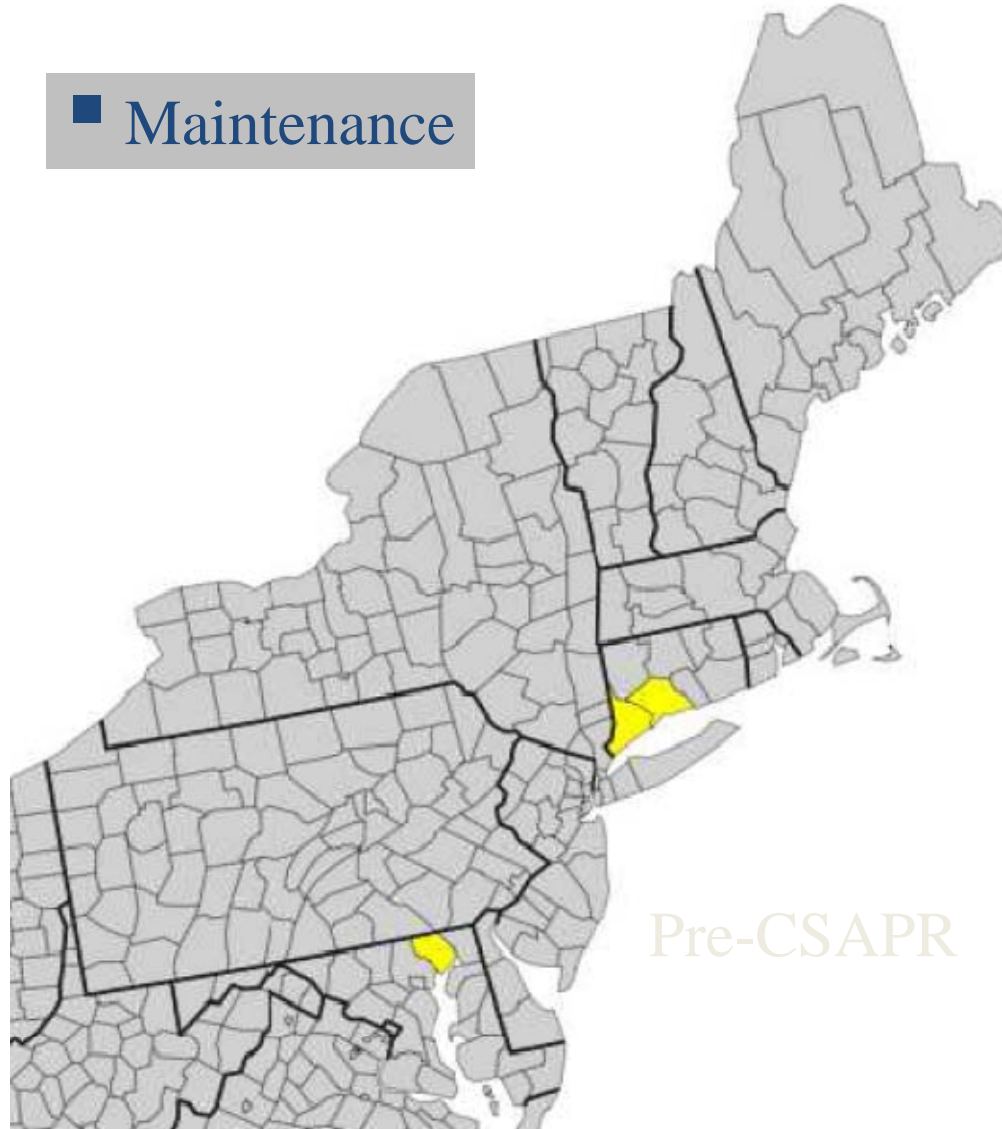
2000 Nonattainment 0.085 ppm NAAQS

■ Nonattainment



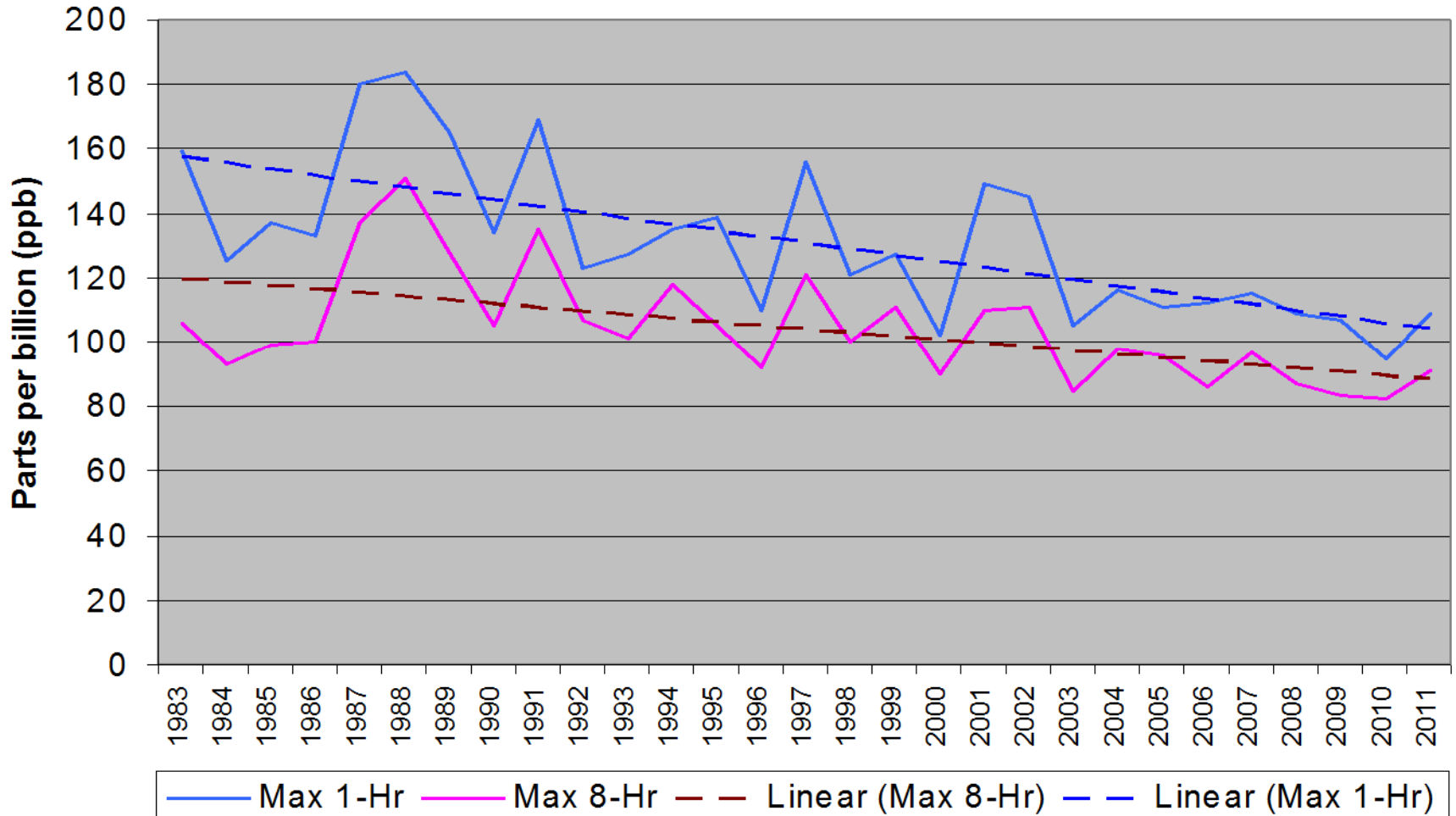
Projected 2012 0.085 ppm NAAQS

■ Maintenance



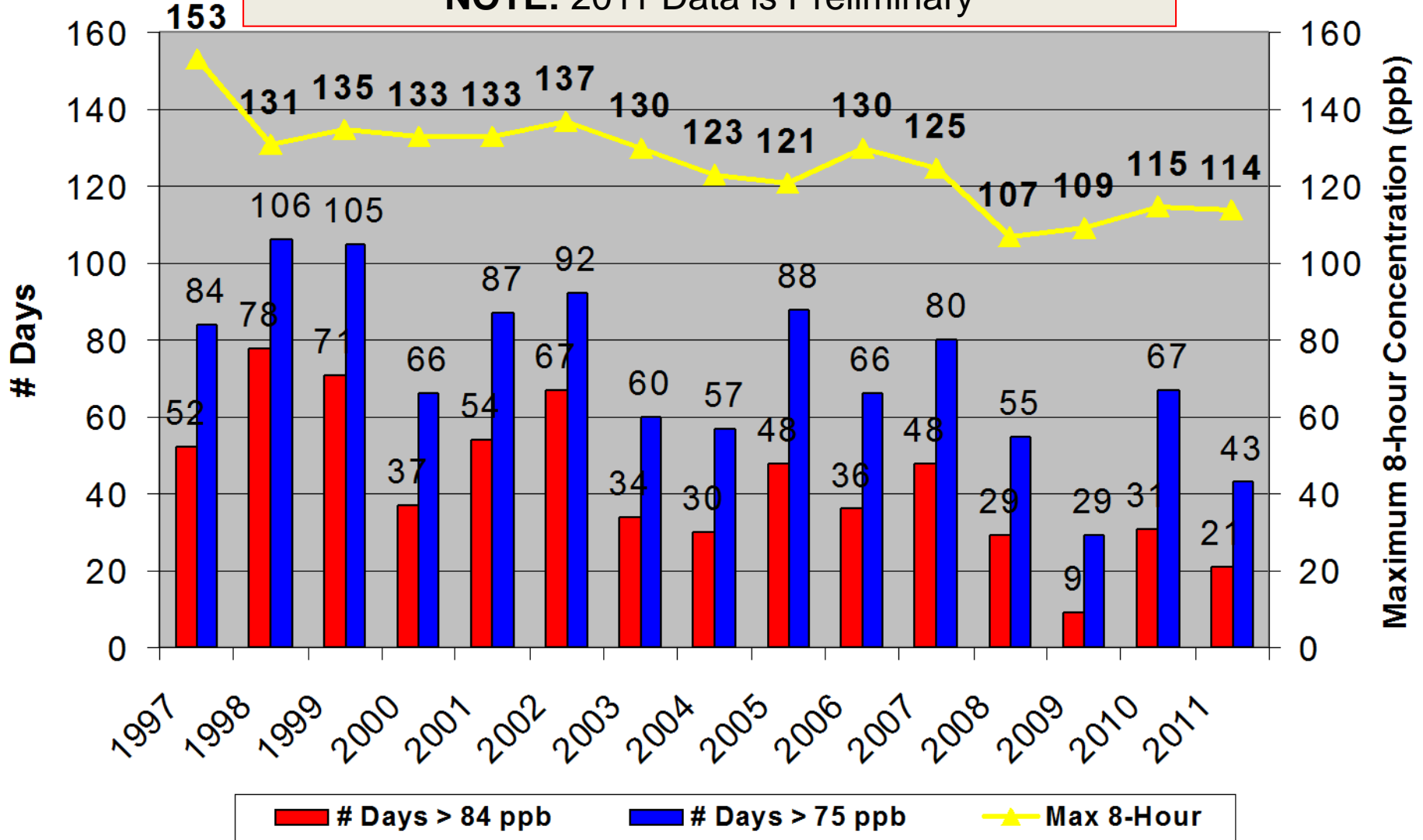
A Long and Successful Story

**New Hampshire Maximum Ozone Trends
1 and 8 Hour Ozone (1983 to 2011)**



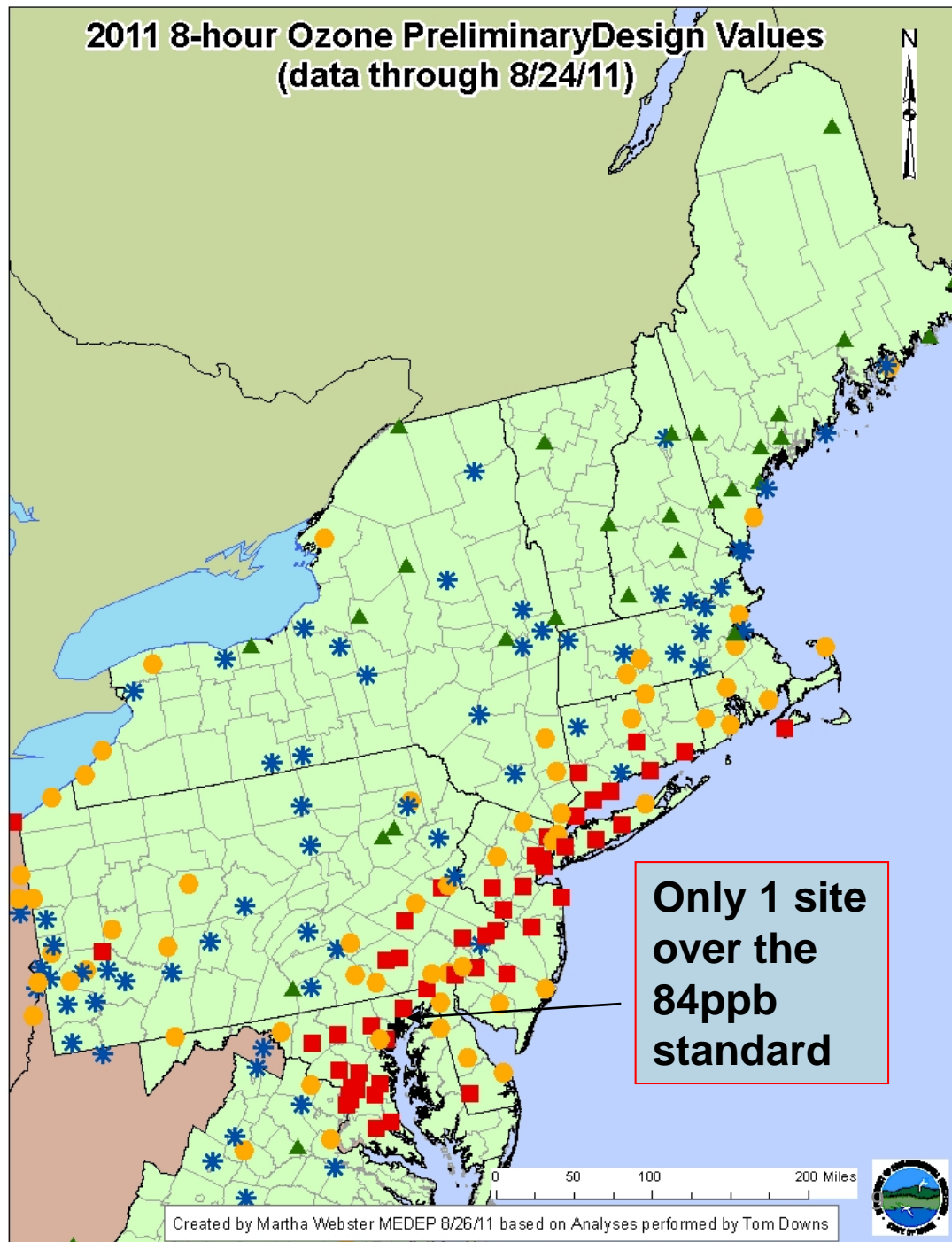
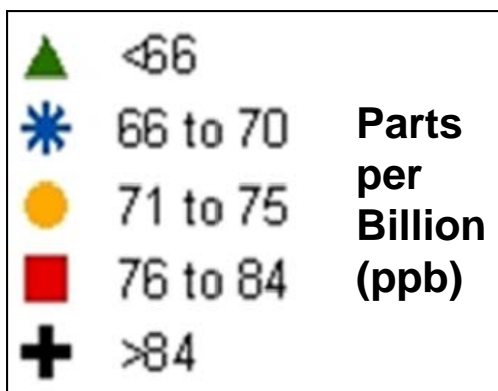
OTR Ozone Day Trends 1997-2011

NOTE: 2011 Data is Preliminary



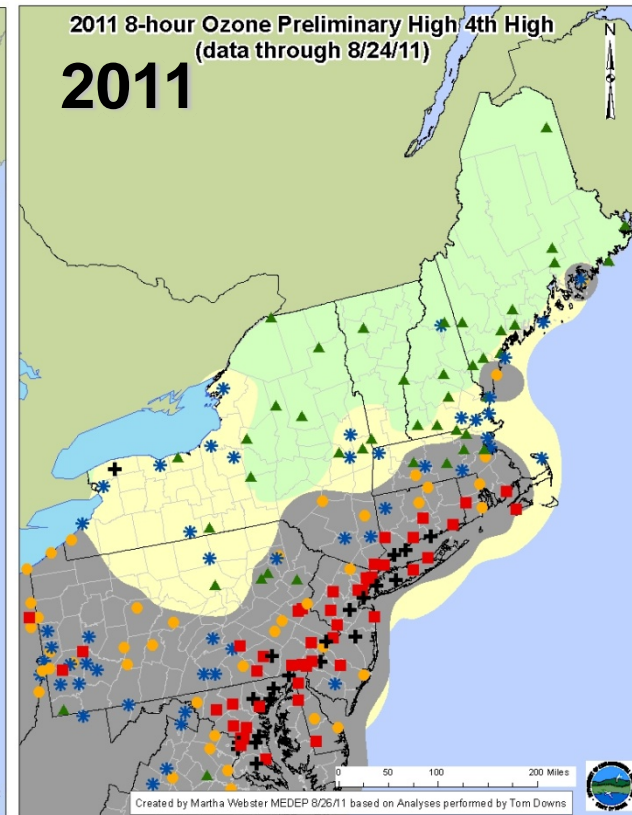
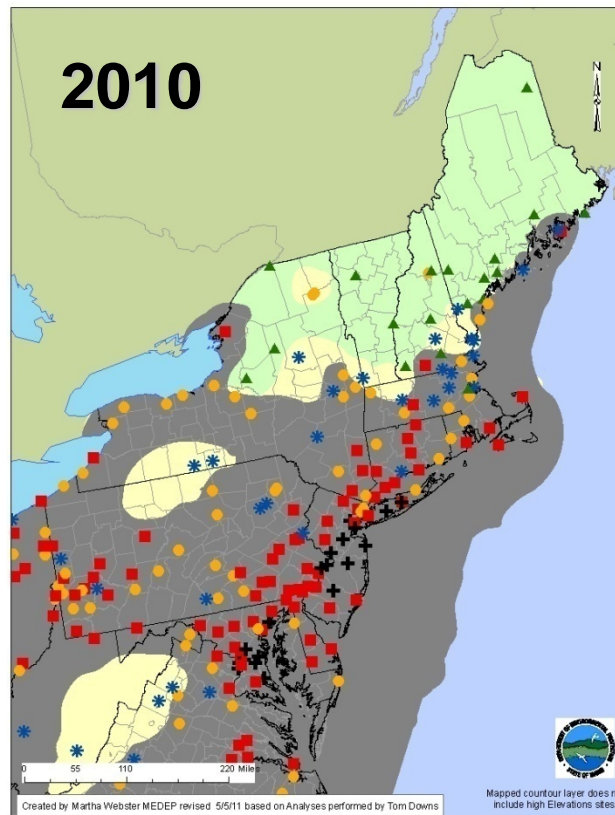
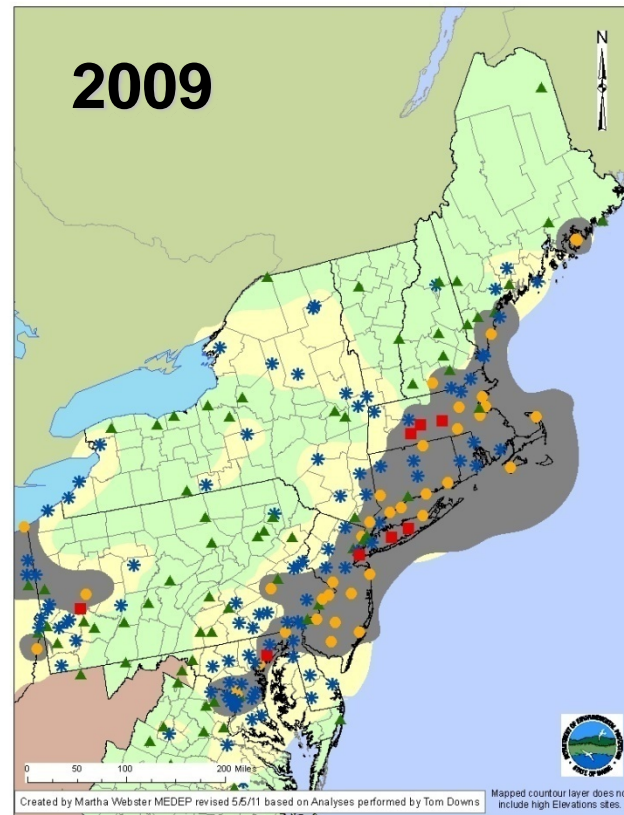
Preliminary 2009-2011

Design Values in the OTR

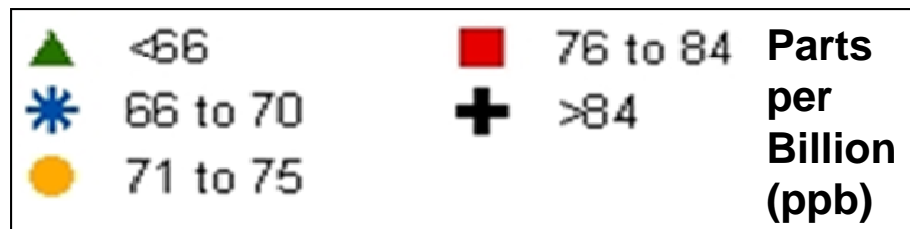


Annual 4th High Ozone Values

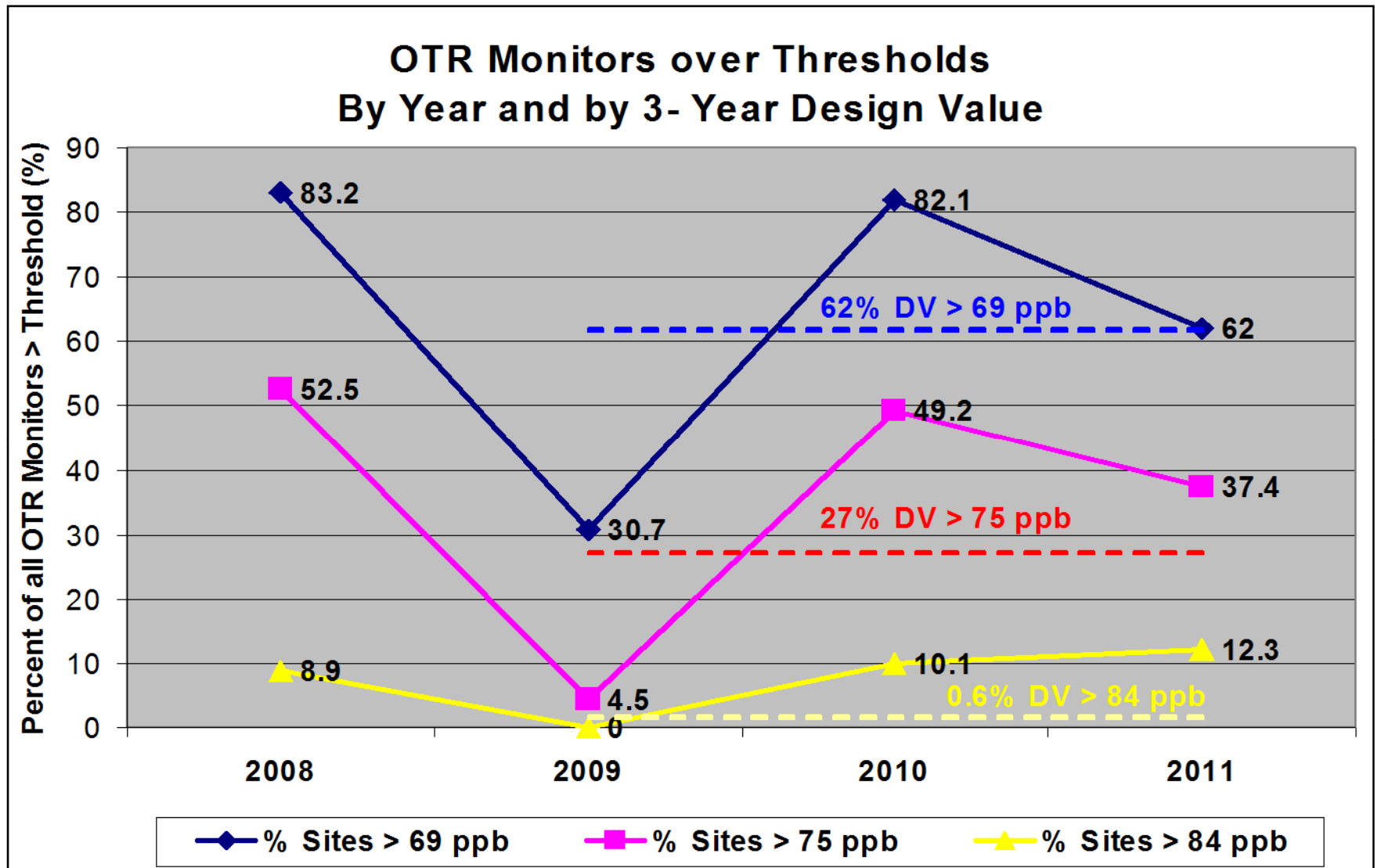
for the 3 Design Value Years – 2009, 2010 and 2011



Grey shaded area highlights general areas greater than 70 ppb ozone



OTR Monitors over Selected Ozone Levels



NOTE: the low percentage in 2009 over the 75 NAAQS

2 – SCREENING MODELING UPDATE

Screening Modeling: Informing Policy

Level 1 Screening – **DONE**

- Used best available 2007 emission inventory and projects three future year control scenarios (including “**Scenario 3**”)

Level 2 Screening – **Nearing Completion**

- Uses higher quality 2007 emission inventory to test model performance
- Uses best available 2020 emission inventory to reassess “Scenario 3” – New case is called “**Scenario 4**”
- 2 bounding runs with reductions from base of 48%NO_x/23%VOC & 68%NO_x/23%VOC

Level 3 Screening – **Proposed**

- Final 2007 emission Base Case
- High quality 2020 emission inventory with ERTAC EGU projections
- Additional bounding and sensitivity runs

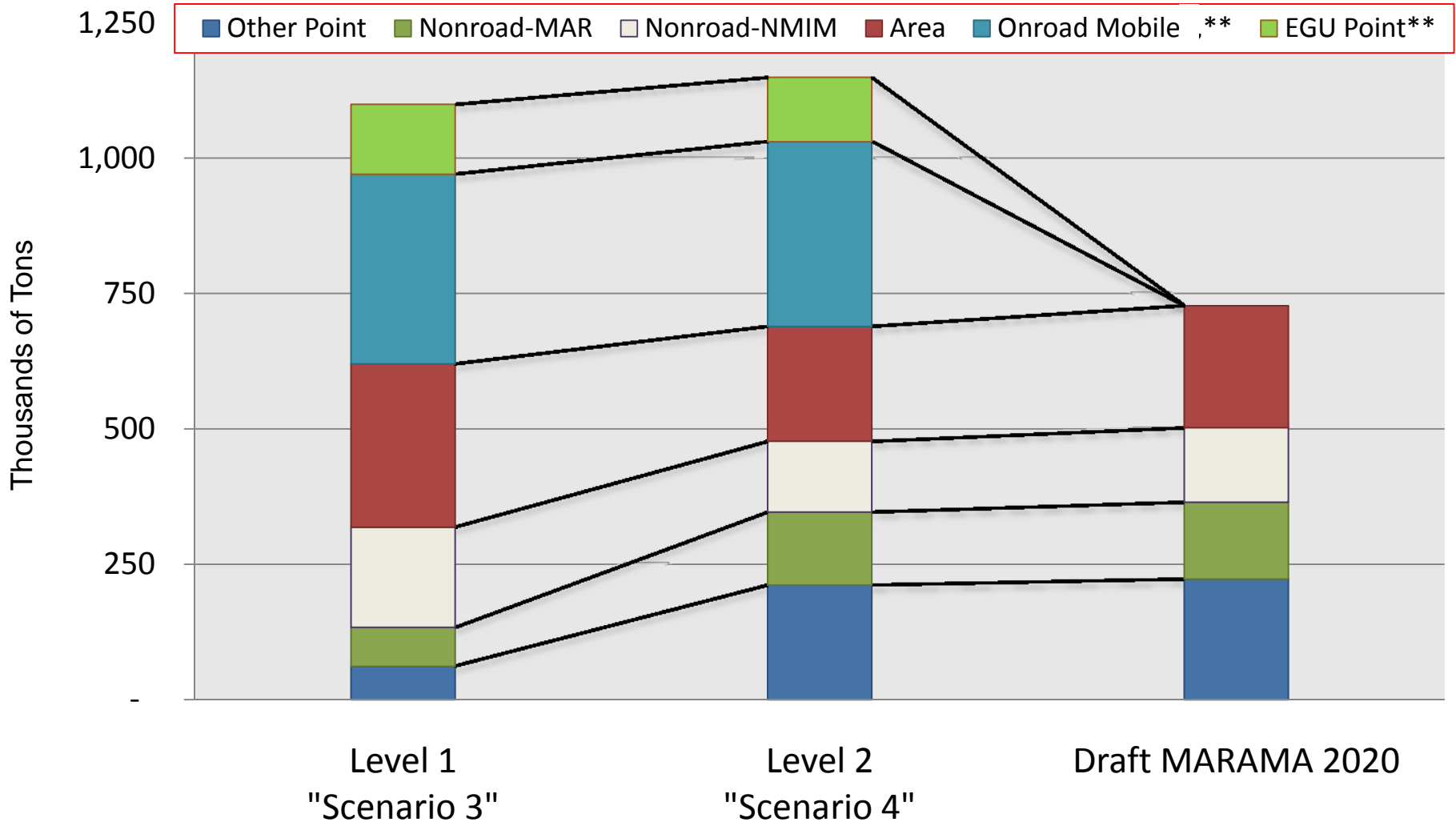
SIP Modeling – **Final high-quality assessment**

“Scenario 3” vs “Scenario 4”

- Both approximate OTC’s recommendations
- Theoretical reductions applied:

Scenario 3	Scenario 4
Scales from 2007 (or 2005)	Uses best available 2020 data except where noted
Domain-Wide NOx Reductions <ul style="list-style-type: none"> • Point: 65% (includes EGUs and ICI boilers/cement kilns) • Onroad: 75% (LEV3) • Nonroad: 35% 	Domain-Wide NOx Reductions <ul style="list-style-type: none"> • Point: 65% (EGUs) from 2007 • Onroad: 70% (LEV3) from 2007
Domain-Wide VOC Reductions <ul style="list-style-type: none"> • 30% man-made sectors 	Domain-Wide VOC Reductions <ul style="list-style-type: none"> • 30% EGU & On-road sectors from 2007
OTR Only: Extra 5% NOx	OTR Only: Extra 5% NOx

Comparison of Annual NO_x Emissions



**MARAMA 2020 Mobile and EGU have not been prepared yet and were omitted.

NOTE: Scenarios 3 & 4 Should be considered as Controlled Inventories

Level 2 Screening Modeling Status

- CMAQ Screening Runs

Base Case	NYDEC	Processing Results
“Scenario 4”	NJDEP	Processing Results
48%NO _x /23%VOC Bounding	NYDEC	Processing Results
68%NO _x /23%VOC Bounding	MDE VADEQ	Processing Results Processing Results

- NYDEC began analysis of CMAQ results in middle of August
- MDE & VADAAQ both ran a 68%N/23%V bounding run. The results will be used to evaluate cross platform model performance

Weight of Evidence

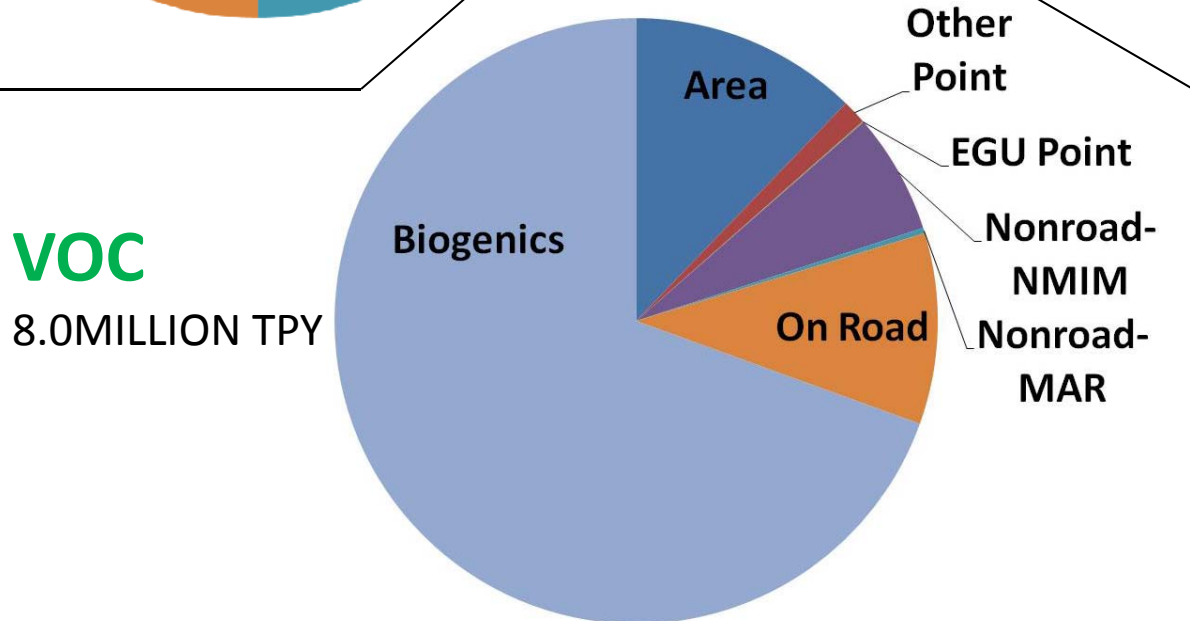
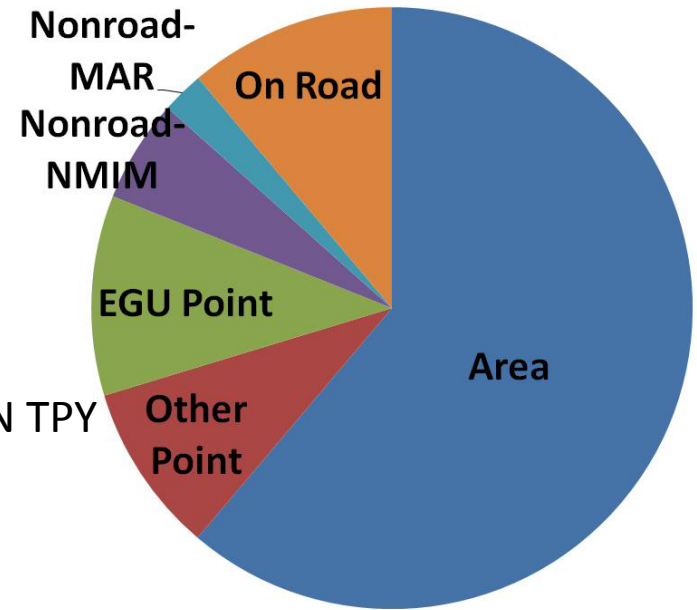
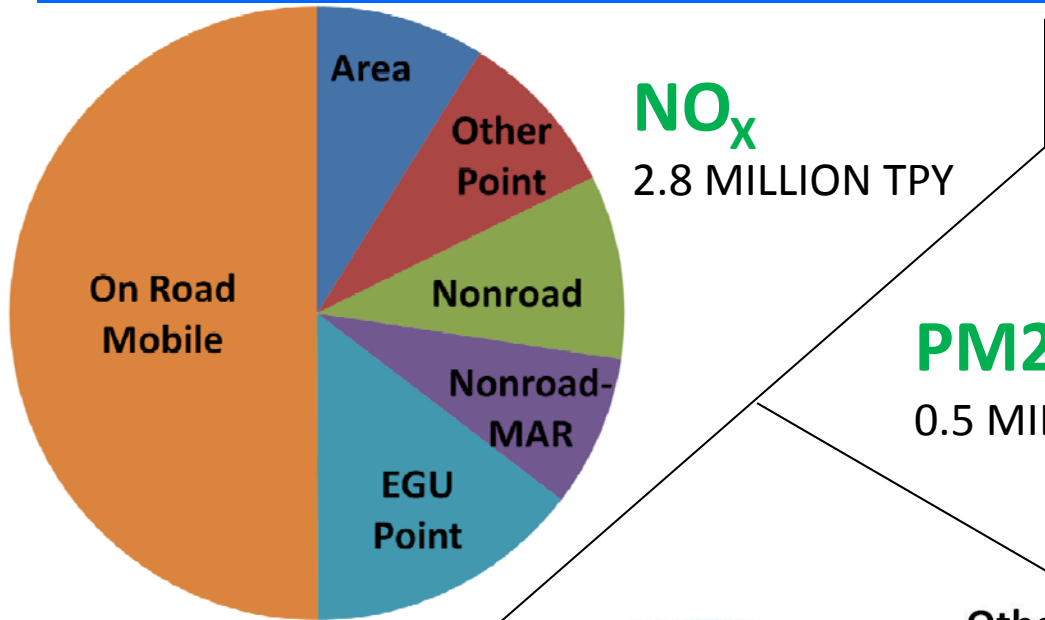
- Transmitted expanded weight of evidence recommendations to EPA on 6/17/2011
- OTC anticipates member states may include CALGRID screening modeling as part of weight of evidence
 - CALGRID 2.6 (CB05 Upgrade) currently under development
 - Pending model performance, could be used for additional sensitivity screening modeling in support of SIPs.

3 – EMISSION INVENTORY UPDATE

Screening Emission Inventory Summary

	Mobile	EGU	Other Point & Nonroad	Area	Non-OTR
Level 1 2007	Mobile 6 Proxy (2002-2009 interpolation)	MARAMA 2007	MARAMA 2007	Proxy (2002-2009 interpolation)	EPA/Chief 2005 And Proxy (2002-2009 interpolation)
Level 1 2020 "Scenario 3"	Proxy	Proxy	Proxy	Proxy	Proxy
Level 2 2007	MOVES 2007	MARAMA 2007	MARAMA 2007	MARAMA 2007	2008 NEI
Level 2 2020 "Scenario 4"	Proxy	Proxy	MARAMA 2020	MARAMA 2020	Proxy
Level 3 2020	MOVES 2020	ERTAC 2020	MARAMA 2020	MARAMA 2020	Proxy options (or data from other RPOs)

2007 Emissions OTC+VA Region



Mobile emissions are draft and subject to change (Preliminary MOVES run)

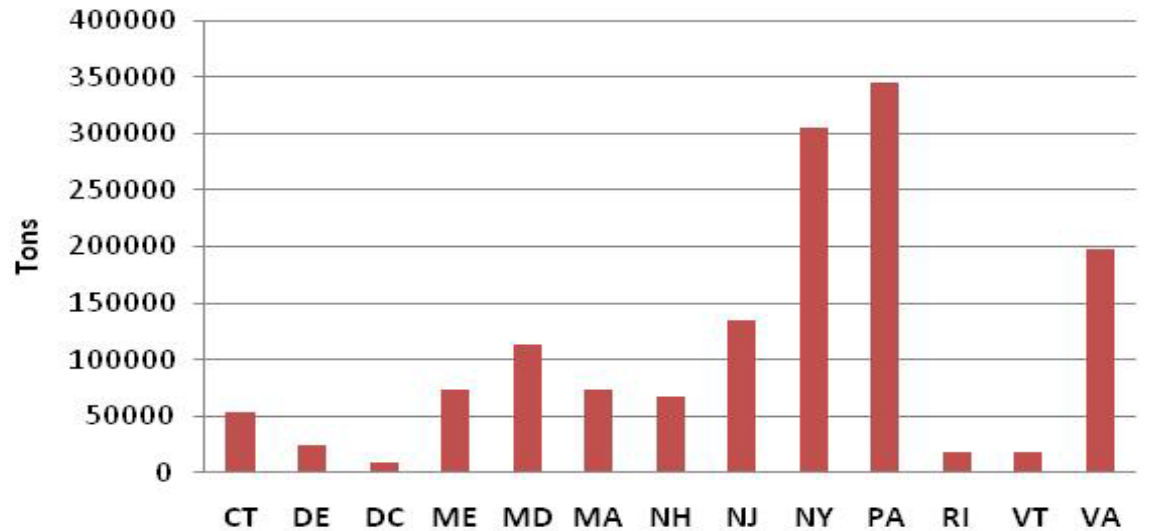


MOVES is Preliminary

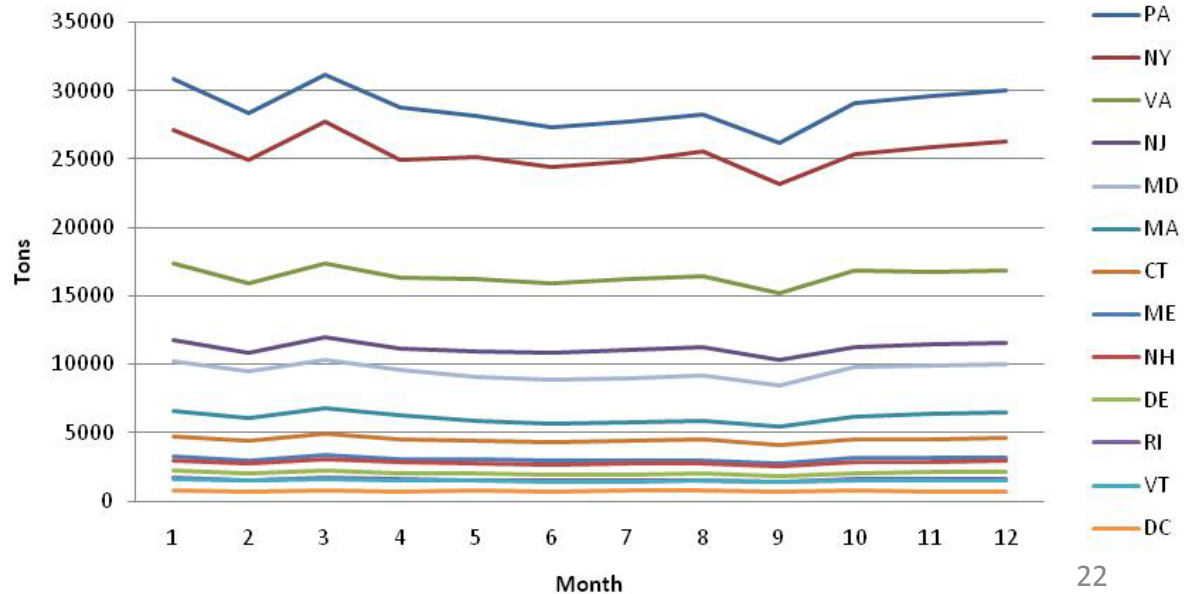
- EPA is preparing an updated version of the SMOKE-MOVES model
 - Addresses some issues found by MANE-VU
- Virginia is reviewing issues with VOC in October
- We anticipate modeling centers will re-run 2007 with updated SMOKE-MOVES before running 2020

2007 Preliminary MOVES State Level Onroad NO_x Data

- **Annual state totals**
Comparison looks reasonable

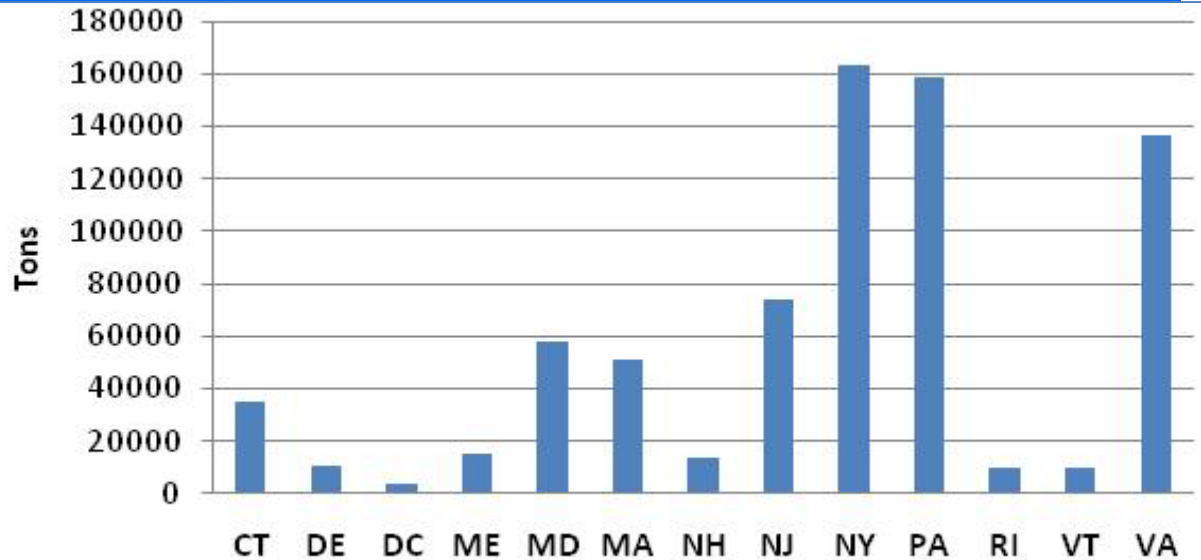


- **State Monthly Trend**
All states follow the same pattern



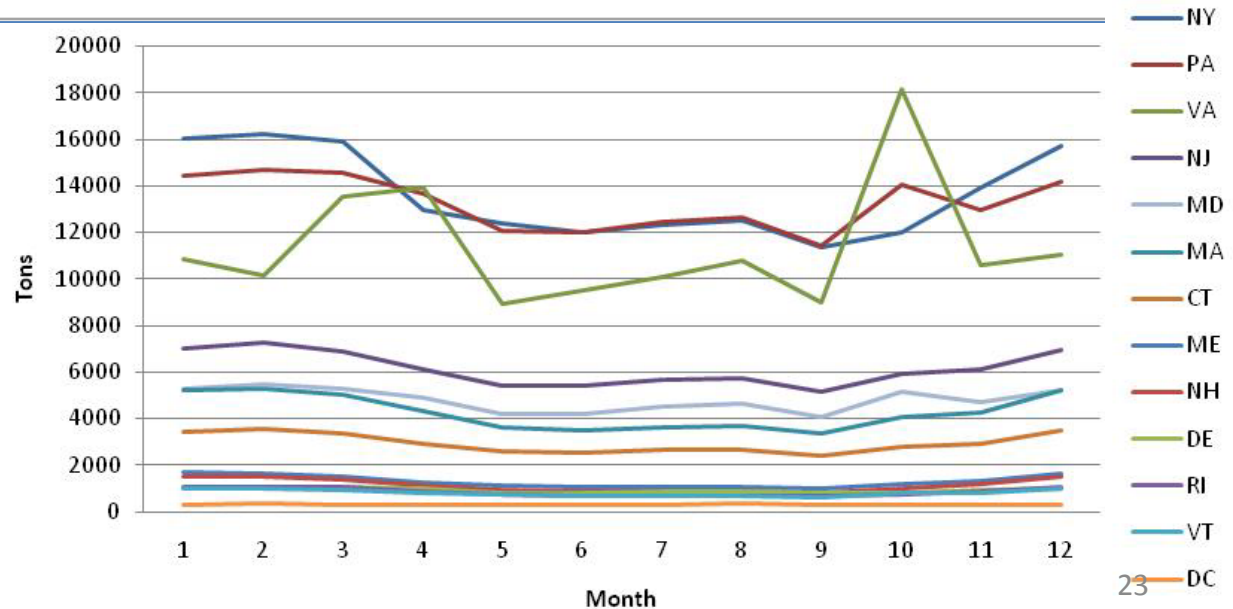
2007 Preliminary MOVES State Level Onroad VOC Data

- **Annual state totals**
Comparison looks reasonable



- **State Monthly Trend**
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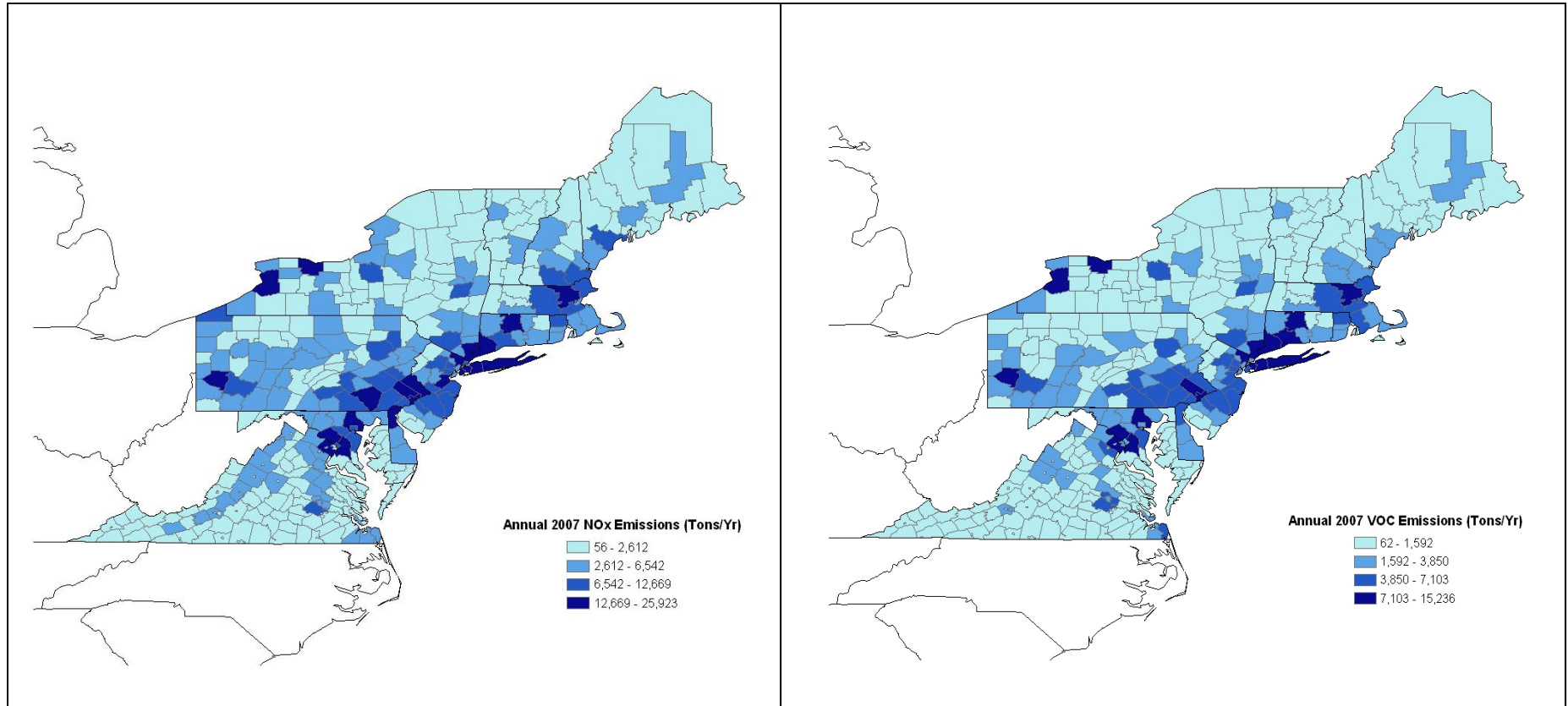
VA and PA have a slightly different pattern with drastic peaks in October.



Preliminary Spatial Analysis of 2007 Onroad Emissions

2007 NO_x

2007 VOC



- Urban areas & the I-95 corridor have the highest emissions.



ERTAC - Future EGU Emissions

- Eastern Regional Technical Advisory Committee
- Collaboration:
 - States throughout country and multi-state organizations
 - Industry stakeholders
- Goal: Develop improved and transparent methodology to estimate EGU future year emissions

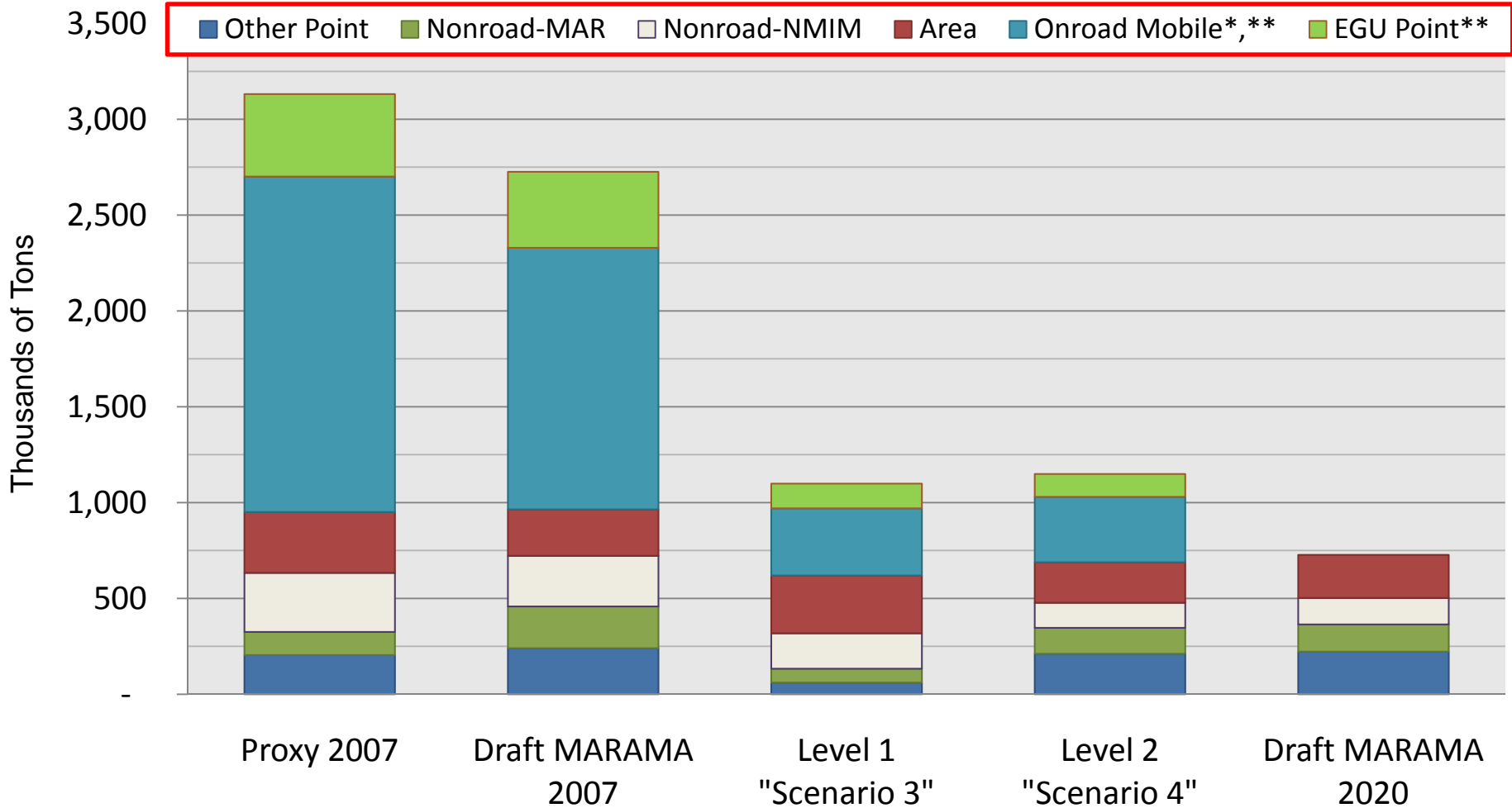
ERTAC: Status

- First edition of code was provided in mid-July
- Anticipated schedule for remaining code development:
 - **Mid-Sept.** – Complete alpha version of code, testing on small scale data sets
 - **End of Sept.**- Update design document and draft End-User documentation
 - **Mid Oct.** – Run large-scale data sets to test code performance. Identify areas where speed improvements might be wanted.
 - **Oct. – Dec.** – Fix bugs and finalize documentation.
 - **2012** - Run model to obtain estimates.

Estimated Inventory Development Timeline

Sector	2007 Inventory Timeline	2020 Base Inventory Timeline
EGU Point	Complete	Early 2012?
Non-EGU Point	Complete	Complete
Area	Complete	Complete
Non-Road (NMIM)	Complete	Complete
Non-Road (M/A/R)	Complete	Complete
On-Road (MOVES Lookup)	Draft complete Redo Sept/Oct?	Nov 2011?
SESARM	Unknown	Unknown
LADCO	Unknown	Unknown

Comparison of Annual NO_x Emissions



*MARAMA 2007 Mobile Emissions are draft. MOVES results will not be complete until Fall 2011.

**MARAMA 2020 Mobile and EGU estimates have not been prepared yet and were omitted.

NOTE: Scenarios 3 & 4 Should be considered as Controlled Inventories

This slide was corrected on 9/13 based upon stakeholder comments.

Emission Inventory Critical Path Items

- **EPA & MOVES modelers:** Finish and run new SMOKE-MOVES Tool for 2007 and 2020
- **States:** Review ERTAC Inputs & test alpha model
- **Contractor AMEC (Formerly MACTEC):** Complete ERTAC Model and test
- **MARAMA:** Establish contract(s) & work with states and contractor on
 - Estimate effect of OTC Measures
 - Clean-up of Base and Future Years
 - Final Documentation

QUESTIONS OR COMMENTS?