Modeling Committee Update

OTC Fall Meeting
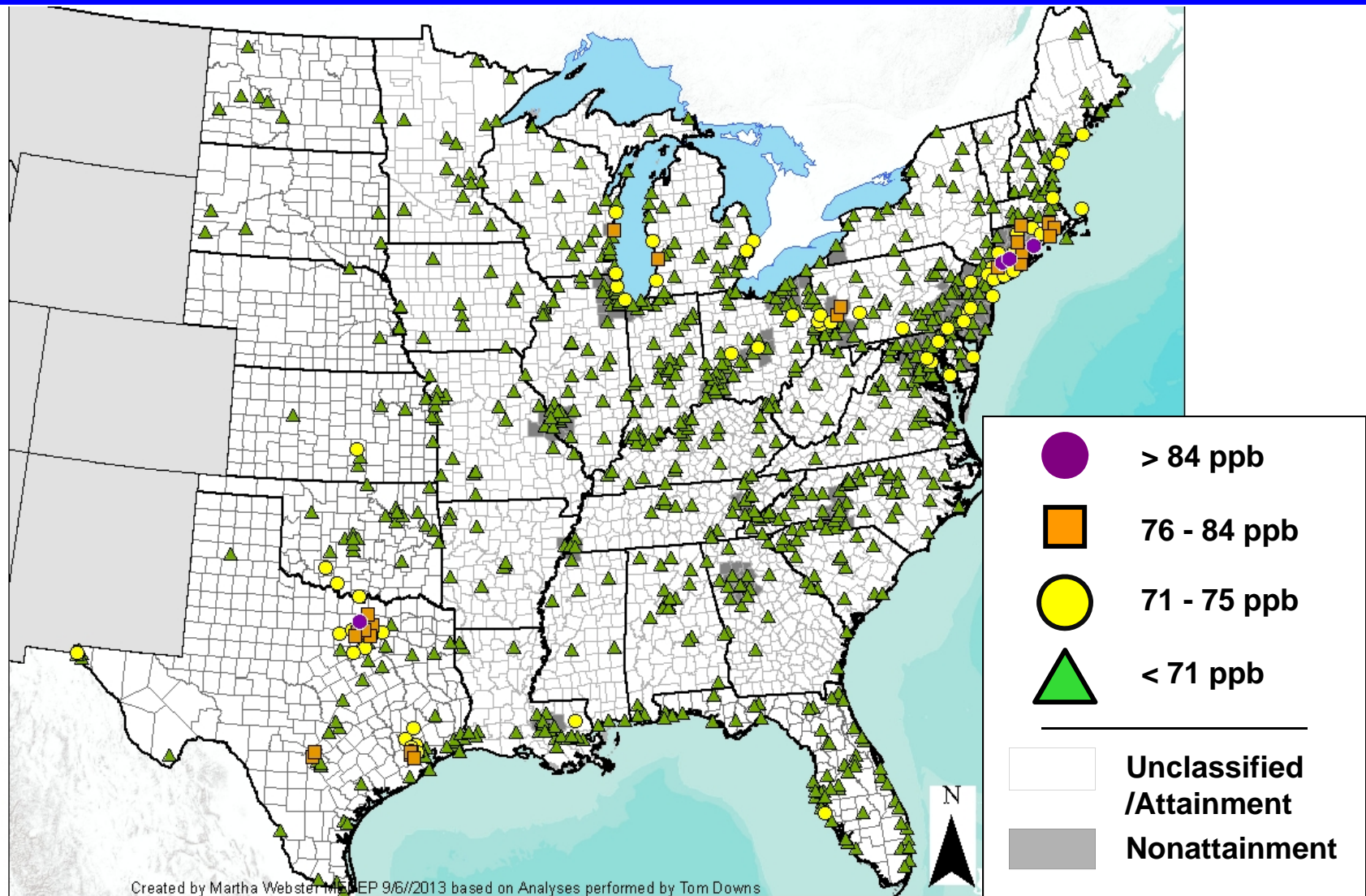## 2013

November 14th, 2013
Washington, D.C.
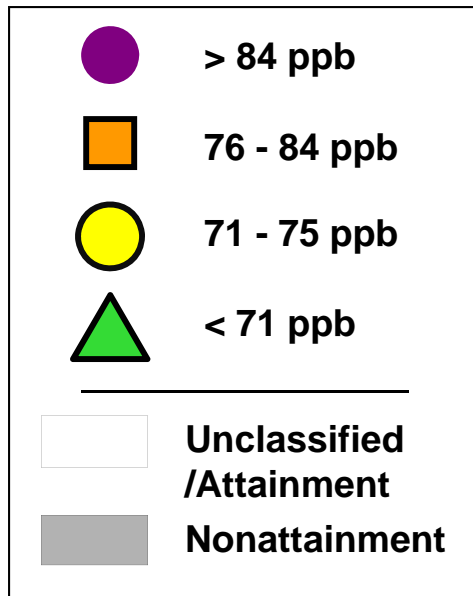
OZONE
TRANSPORT
COMMISSION

Overview

1. 2013 Ozone Season
2. Level 3B Screening Runs
3. Planning for Future Work

Preliminary 2013
Ozone 4th Highest 8-hr Value

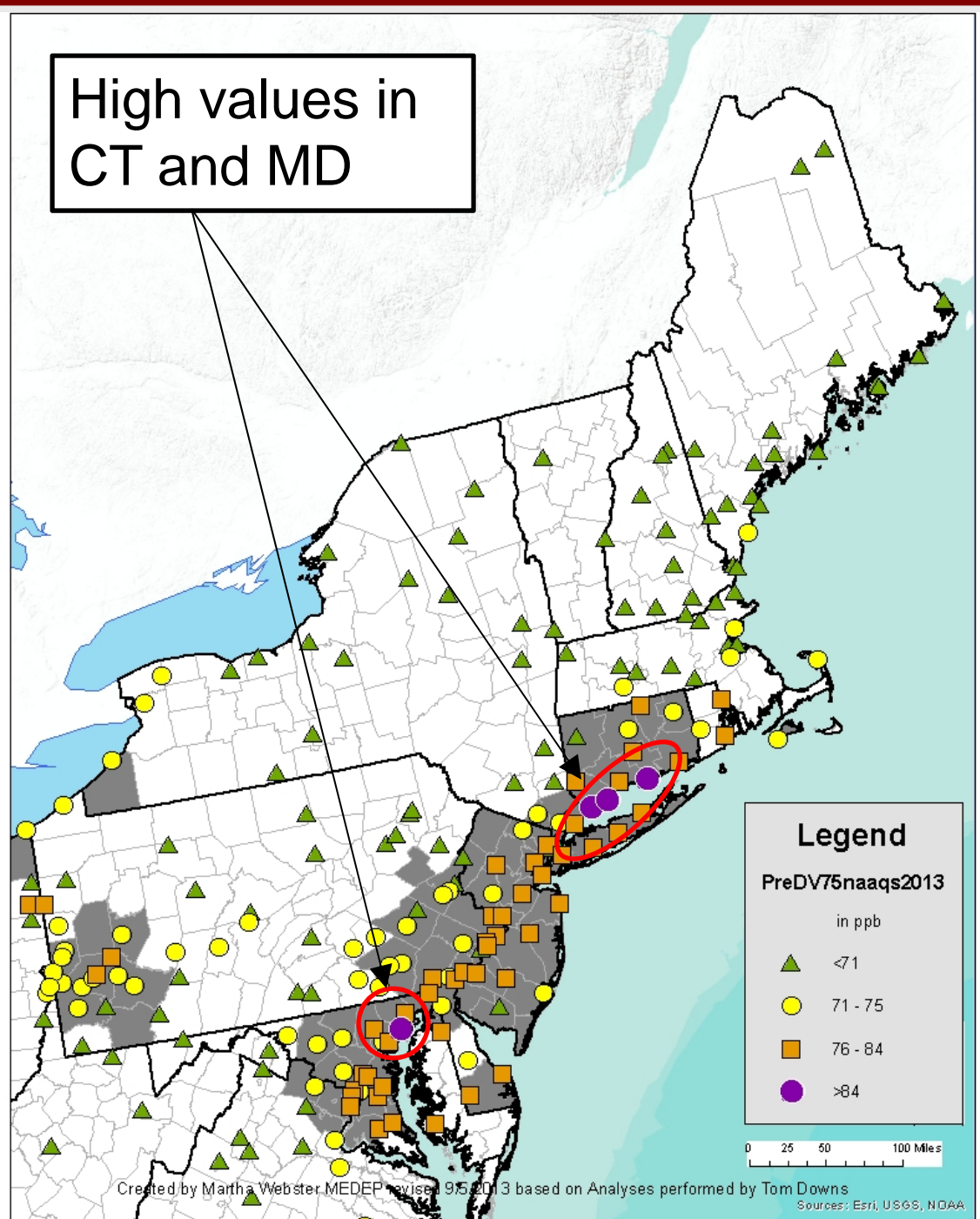

Legend:

- ● **> 84 ppb**
- ■ **76 - 84 ppb**
- ● **71 - 75 ppb**
- ▲ **< 71 ppb**
- **Unclassified /Attainment**
- **Nonattainment**

Created by Martha Webster MDEP 9/6//2013 based on Analyses performed by Tom Downs

Preliminary 2013 Ozone Design Values

Legend:
- ● > 84 ppb
- ■ 76 - 84 ppb
- ● 71 - 75 ppb
- ▲ < 71 ppb

- ☐ Unclassified/Attainment
- ▨ Nonattainment

3-Year average of the 4th high concentration for 2011, 2012, 2013

High values in CT and MD

Legend
PreDV75naaqs2013
in ppb
- ▲ <71
- ● 71 - 75
- ■ 76 - 84
- ● >84

0   25   50   100 Miles

Created by Martha Webster MEDEP revised 9/5/2013 based on Analyses performed by Tom Downs

Sources: Esri, USGS, NOAA

Ozone Maximum by State

State	2013 4th High	2011-13 DV	State	2013 4th High	2011-13 DV
CT	90	89	NJ	74	84
DE	72	77	NY	78	81
DC	66	79	PA	78	80
ME	76	75	RI	79	78
MD	72	85	VT	62	63
MA	78	74	VA (OTR)	67	79
NH	69	69			

2013 Preliminary Data

Ozone Population Exposure

Population Ozone Exposure in the OTR

Population (millions) — y-axis: 0, 10, 20, 30, 40, 50, 60, 70

2011 OTR Population

60%

45%

34%

Percent Above 75ppb

>84ppb
76 - 84ppb

2009-2011 Design Value   2010-2012 Design Value   2011-2013 Design Value

Population based on 2011 Census Estimates
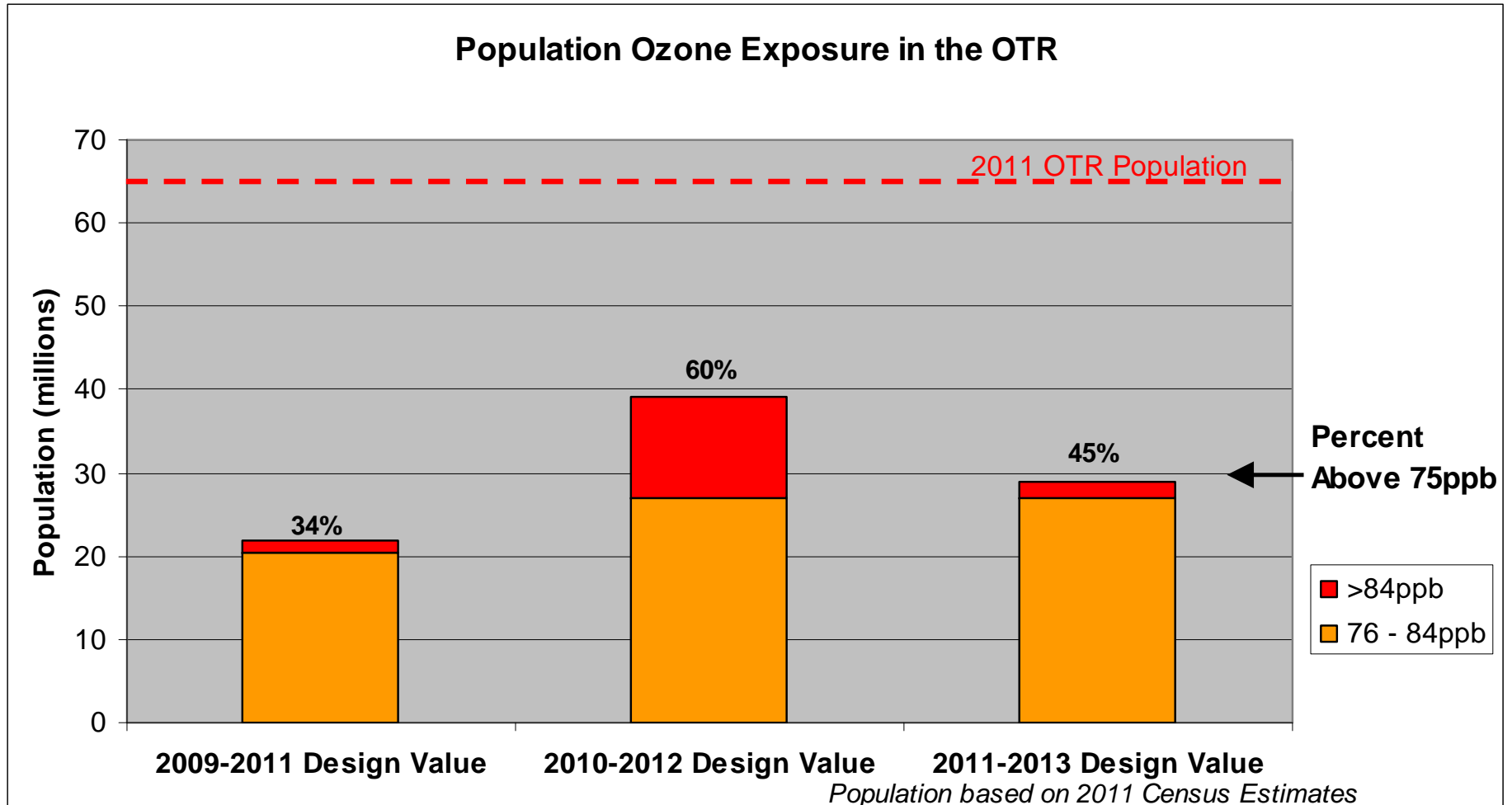
Level 3B Screening Runs

1. ICI Boiler Adjustments

2. Oil and Gas

3. ERTAC

Level 3B Modeling Runs

1. Updated 2020 Base Case
   - ERTAC EGU Emissions
   - Oil & Gas Estimate
   - ICI Boiler Projections

2. 2018 Base Case
   - 2018 ERTAC EGU Emissions
   - Oil & Gas Estimate
   - Interpolation for Other Sectors

ICI Boiler Emissions Adjustments

- Significant changes in the ICI sector from
  - Pressures of compliance with boiler MACT
  - Low costs of natural gas
- Developed emission adjustments for the ICI sector
- Resulted in the following percent reduction from the 2020 base case emissions in the OTC modeling domain:

	ICI Unit Emissions	Δ ICI % of Total Emissions
NO_X	52%	2.3%
SO_2	76%	13.8%
Direct $PM_{2.5}$	82%	3.5%

Oil and Gas Inventory

- 2011 NEI emissions applied for 2018 & 2020 base case projections
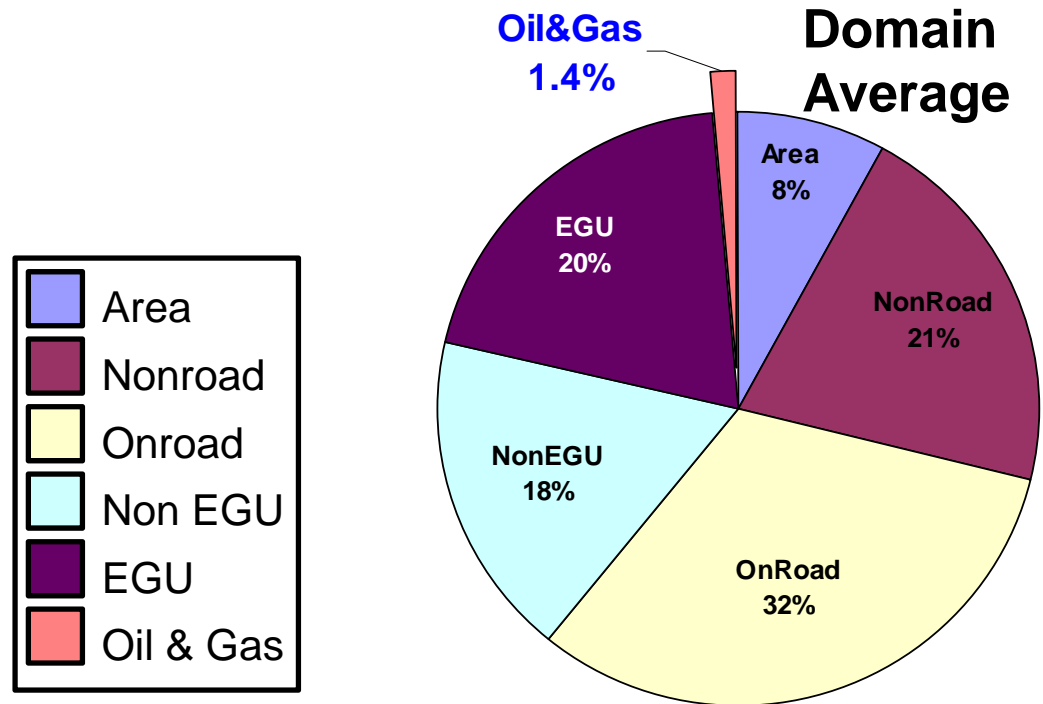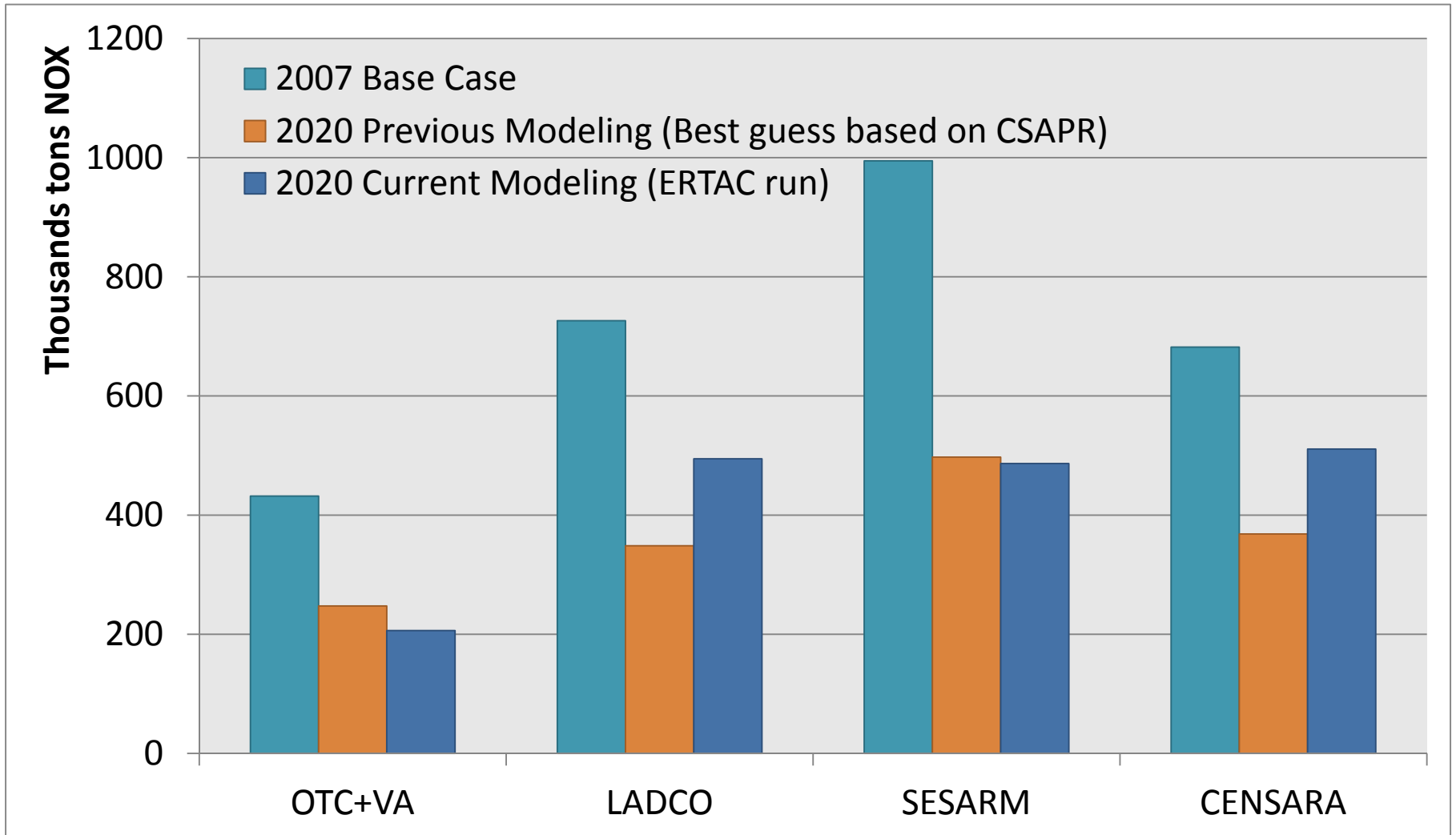- States need to improve future year projections

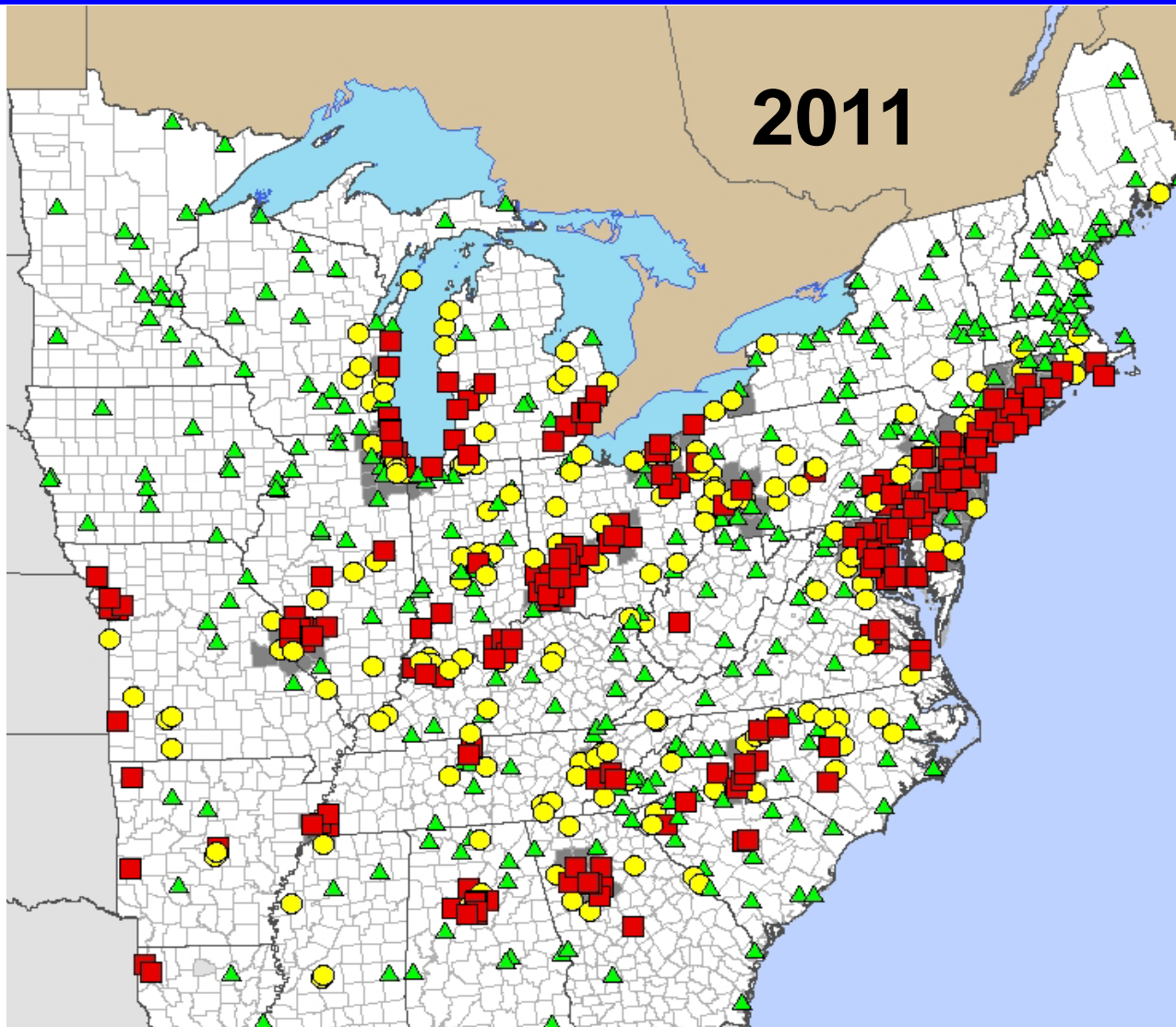## Base NO$_X$ Emission Inventories

PA

Oil&Gas
9%

Area
11%

NonRoad
11%

OnRoad
27%

NonEGU
14%

EGU
28%

Legend:
- Area
- Nonroad
- Onroad
- Non EGU
- EGU
- Oil & Gas

WV

Oil&Gas
16%

Area
2%

NonRoad
12%

OnRoad
11%

NonEGU
18%

EGU
41%

Oil and Gas Inventory

- 2011 NEI emissions applied for 2018 & 2020 base case projections
- States need to improve future year projections

Base NO$_X$ Emission Inventories

Oil&Gas 1.4%

Domain Average

Area 8%

EGU 20%

NonRoad 21%

NonEGU 18%

OnRoad 32%
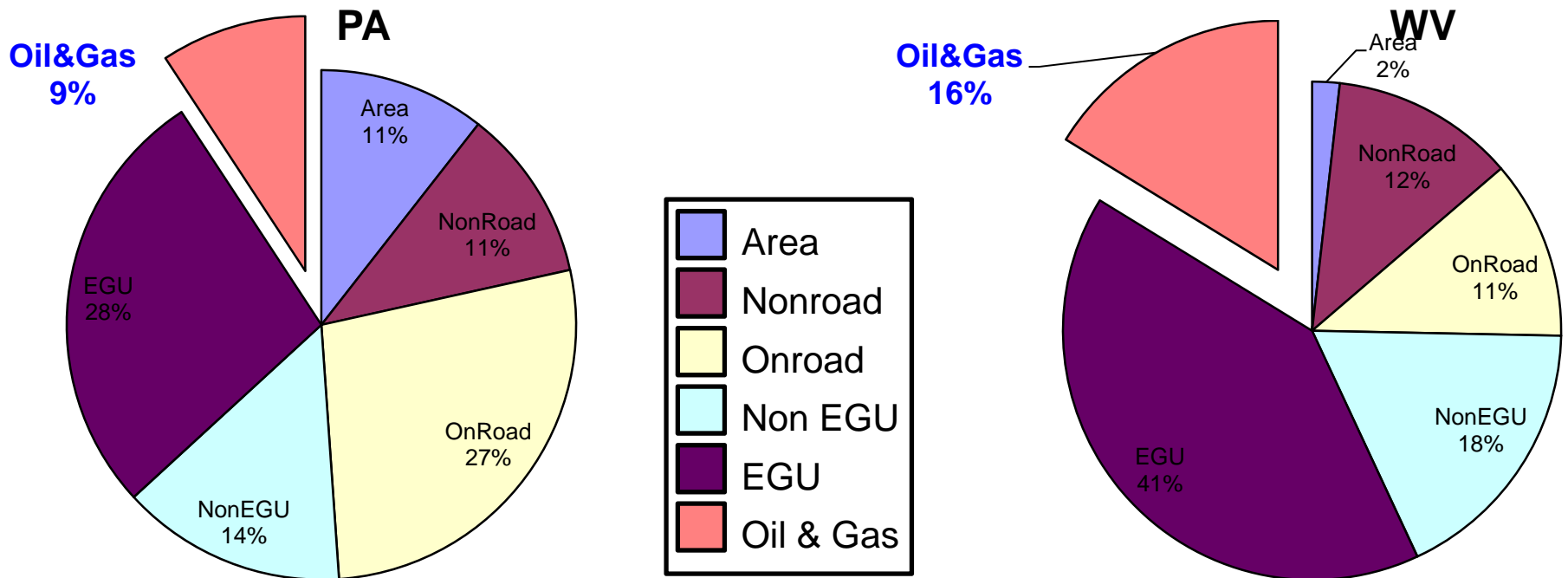
Legend:
- Area
- Nonroad
- Onroad
- Non EGU
- EGU
- Oil & Gas

ERTAC
Estimates of 2020 Annual EGU NO$_X$

Building the
Next Generation Modeling Platform

- New ozone NAAQS and next regional haze SIPs will require an Updated modeling platform

- Building a new modeling platform is a major commitment

- The OTC Modeling Committee will work collaboratively with other regions and EPA in order to:
  - Share expertise
 - Reduce redundancy / expenses

Inter-Regional Technical Coordination

- Planning and Building of the
  - "Next Modeling Platform"
- Coordination with other regions, states, and EPA
  - Sharing ideas and data
  - Analysis of data
- Goals
  - Commonality of modeling data where ever possible
    - Modeling domain
    - Meteorology
    - Emission inventories
- Status
  - Come to agreement on a few first steps
  - Reviewing EPA meteorological data as a cost saving measure
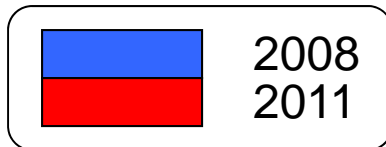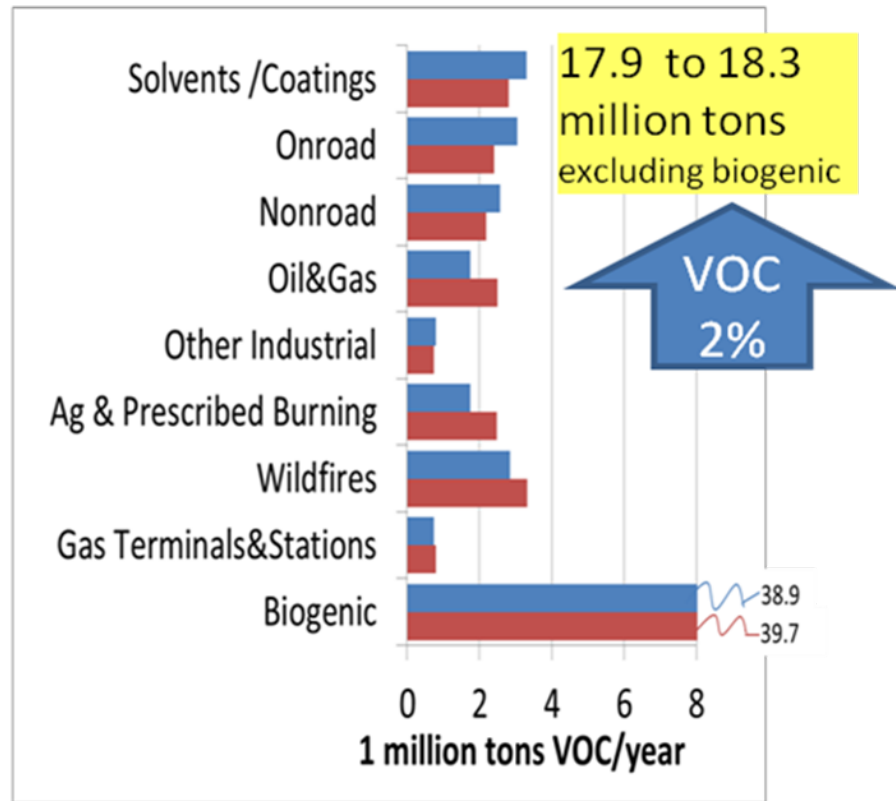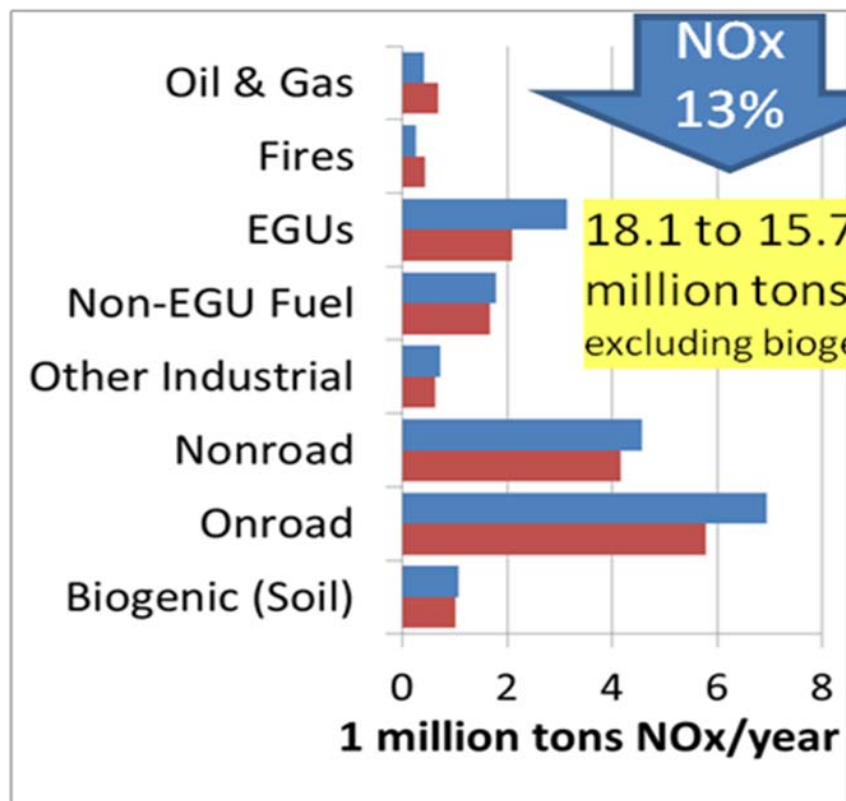
2011 4ᵗʰ Maximum Ozone

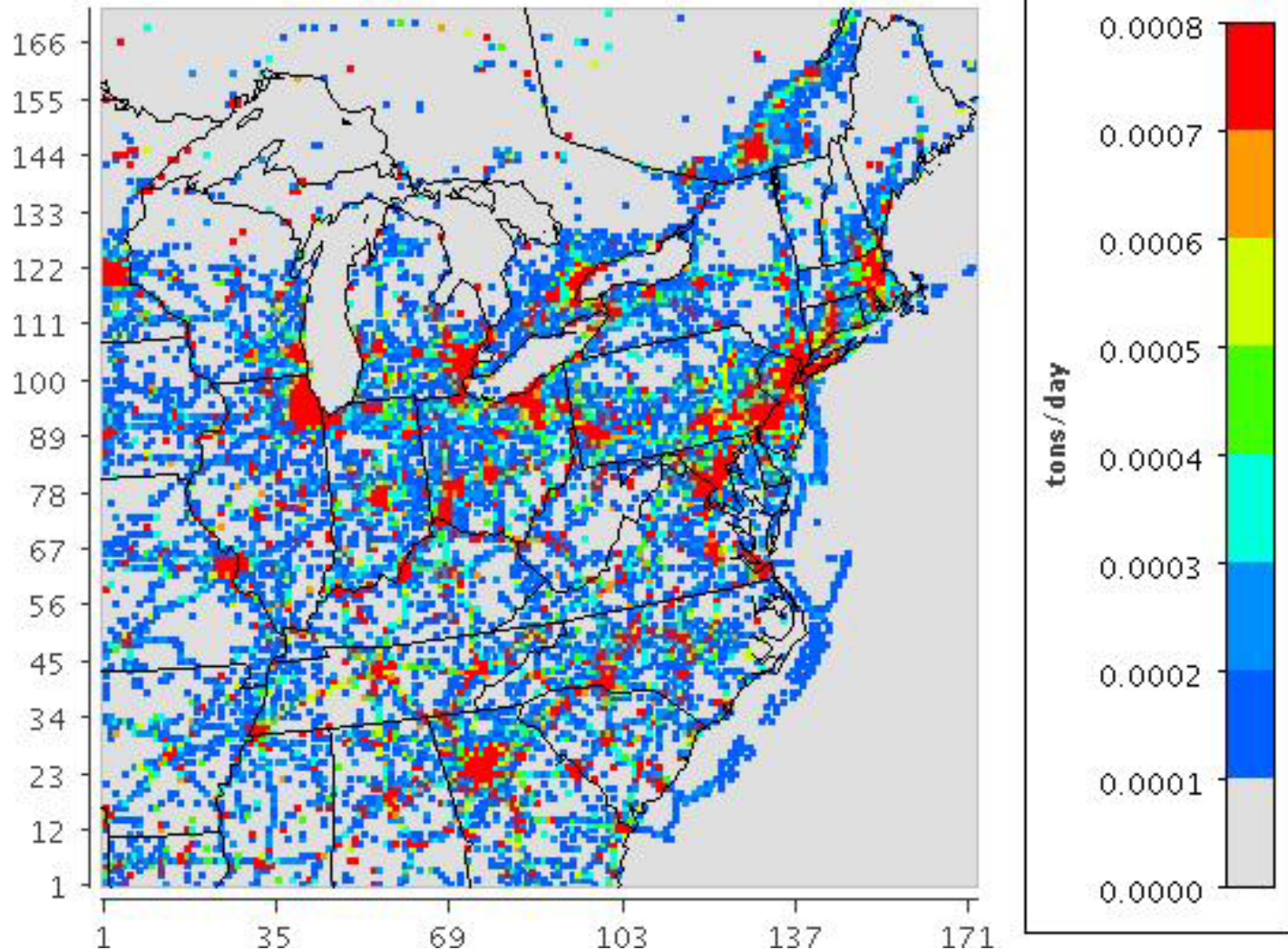**2011**

2011 was a representative year for ozone and transport patterns.

2011 was also an NEI year.

🟥	> 75 ppb
🟨	71 - 75 ppb
🟩	< 71 ppb
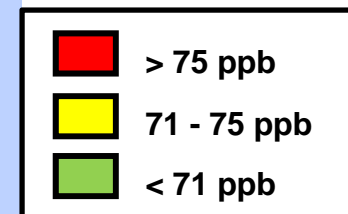
OTR Emissions (NEI) 2008 vs 2011

Geographic Distributions of Relative NOx Emissions

The Next Generation Emission Inventory

- Vision
  - Collaborative platform
  - In-house technical capacity and tools
  - "Improve" EPA's inventory for regional use
  - Regionally coordinated future year inventories
  - Projections for other years as needed
  - Control strategy cost evaluation options
  - Meet SIP deadlines and requirements

Questions

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- Modeling Lead:
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- Emissions Inventory Lead:
  - Julie McDill (MARAMA) jmcdill@marama.org (443) 901-1882

- OTC Committee Lead:
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