



# Ozone NAAQS / SIP Planning

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OTC Annual Meeting 2009  
BWI, Maryland

# Overview

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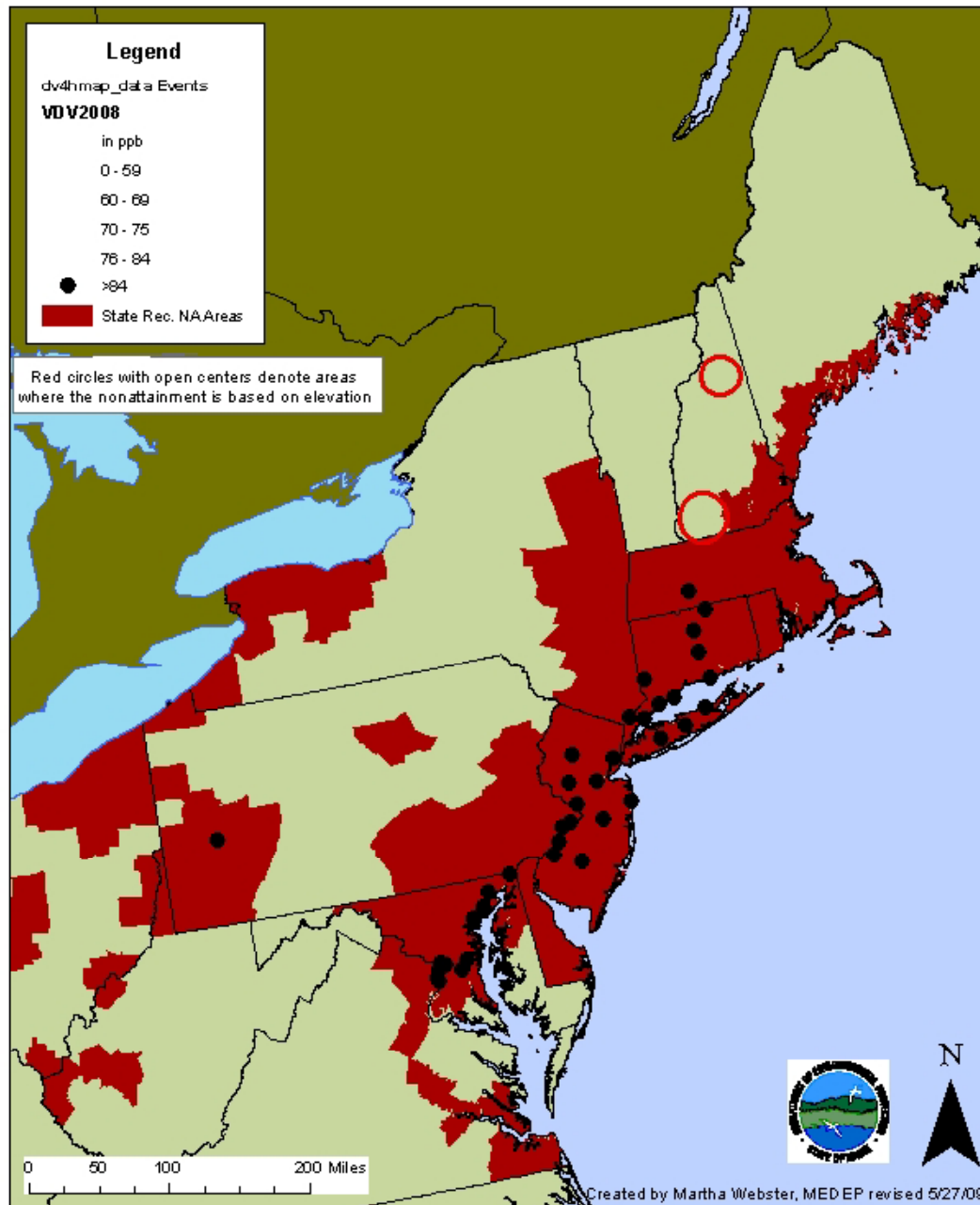
- Air Quality in the OTR
  - Ozone air quality (2006 – 2008 design values)
  - State recommended nonattainment areas
  - SIP schedule
- Potential Control Measures
  - Stationary Area Source Committee
    - Potential measures
    - Costs and emissions reductions
    - Strategies for boilers
  - Mobile Committee
    - Potential measures
    - Measures for further development

# Ozone Air Quality Monitoring

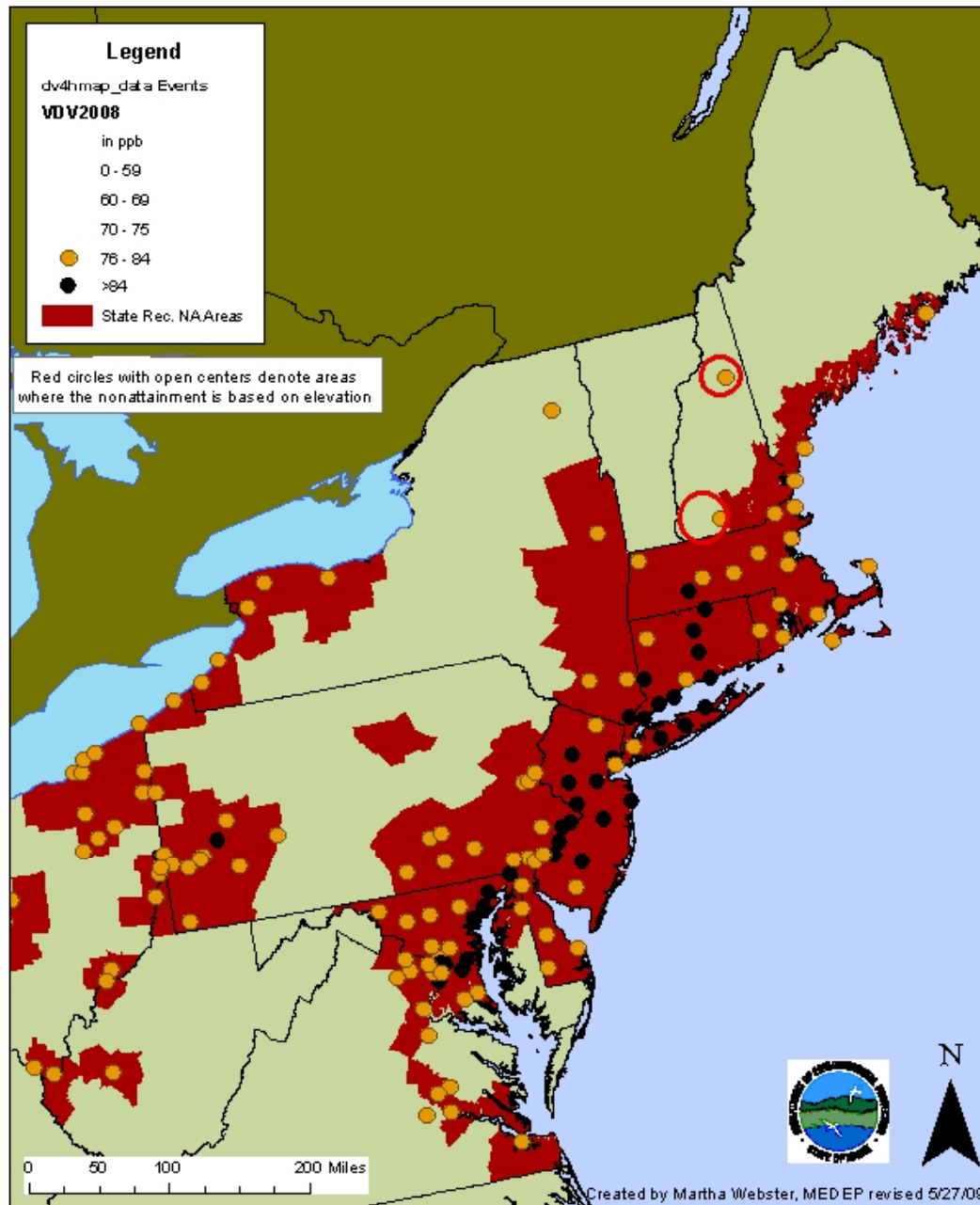
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- Design values – three year average of the fourth highest eight-hour ozone reading of each season
- States used 2006 – 2008 data for nonattainment recommendations

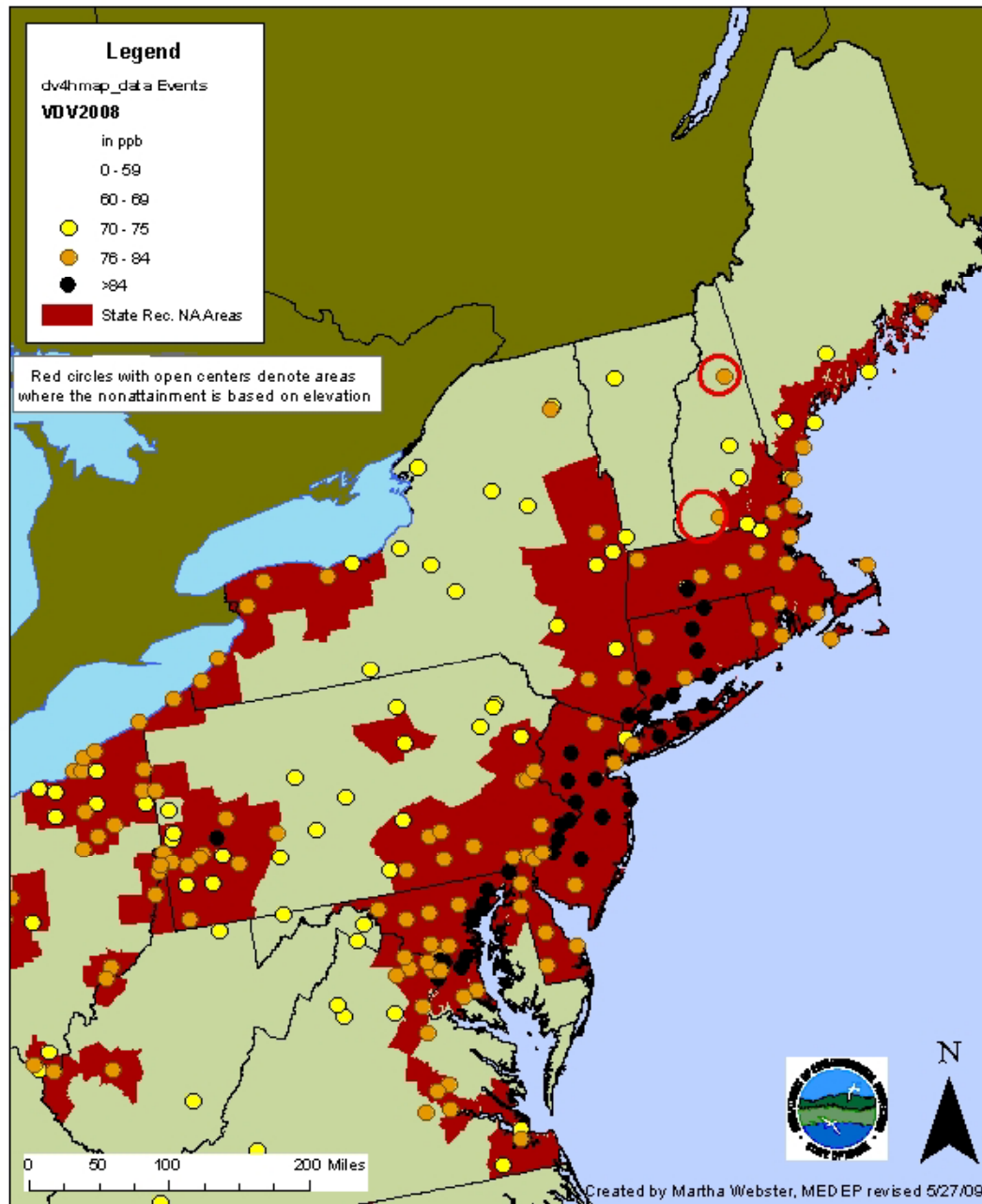
OTC State Recommended Ozone Nonattainment Areas  
for the 2008 Ozone NAAQS of 75 ppb with the Valid 2008 Design Value



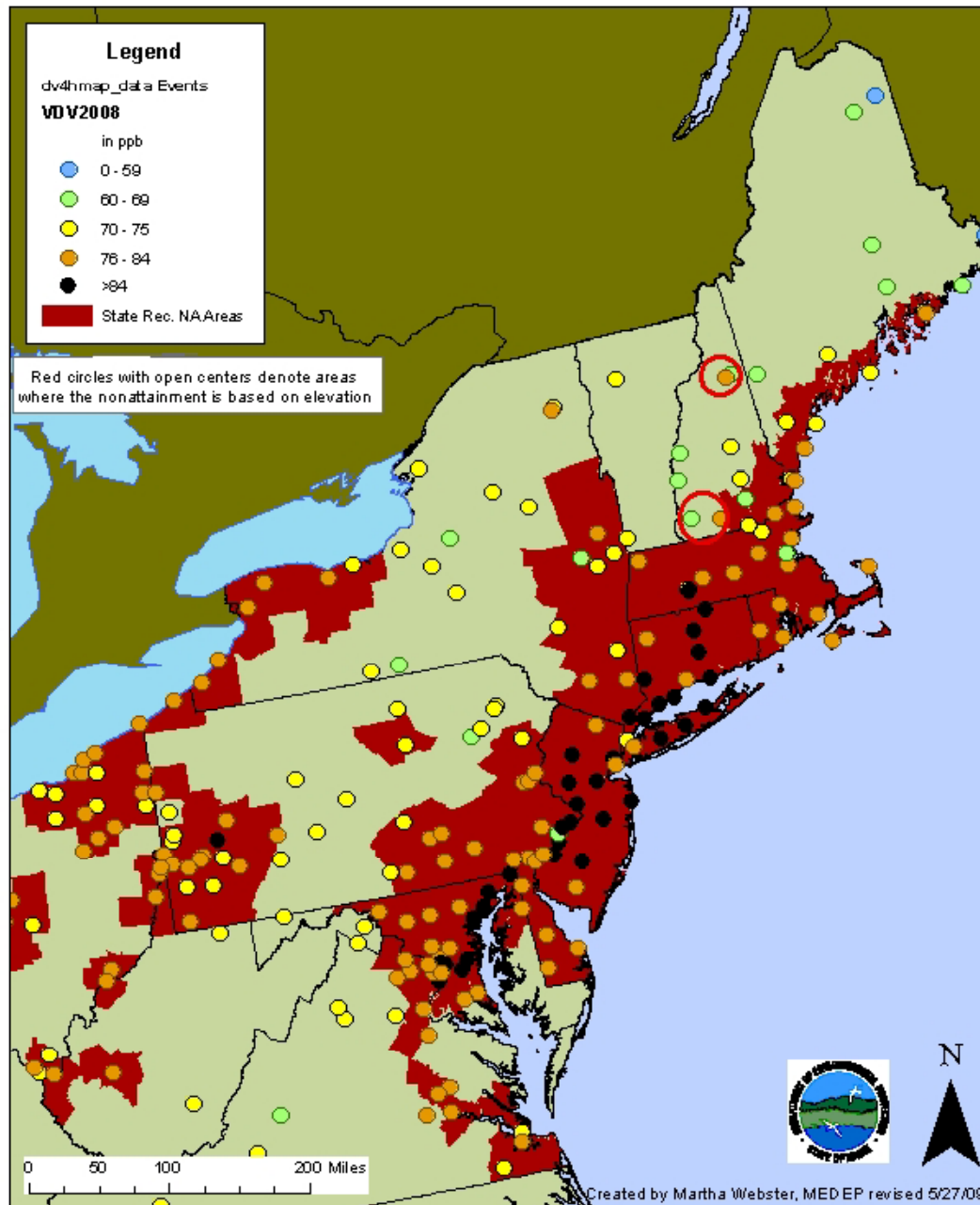
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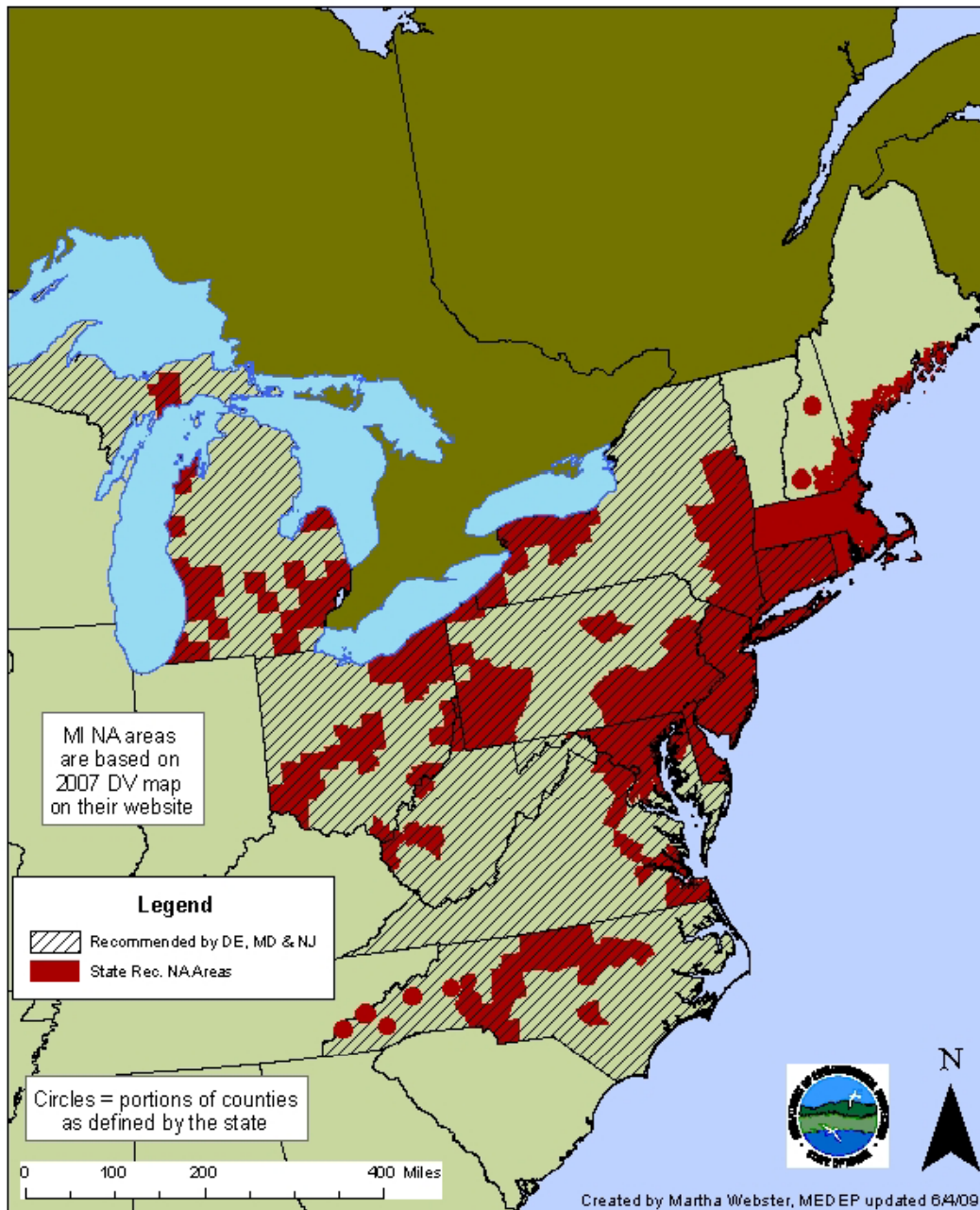
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OTC State Recommended Ozone Nonattainment Areas  
for the 2008 Ozone NAAQS of 75 ppb with the Valid 2008 Design Value



OTC State Recommended Ozone Nonattainment Areas  
with other states recommendations for the 2008 Ozone NAAQS of 75 ppb



*EPA Final Designations:  
March 12, 2010*

Marginal  
Attainment: 2013

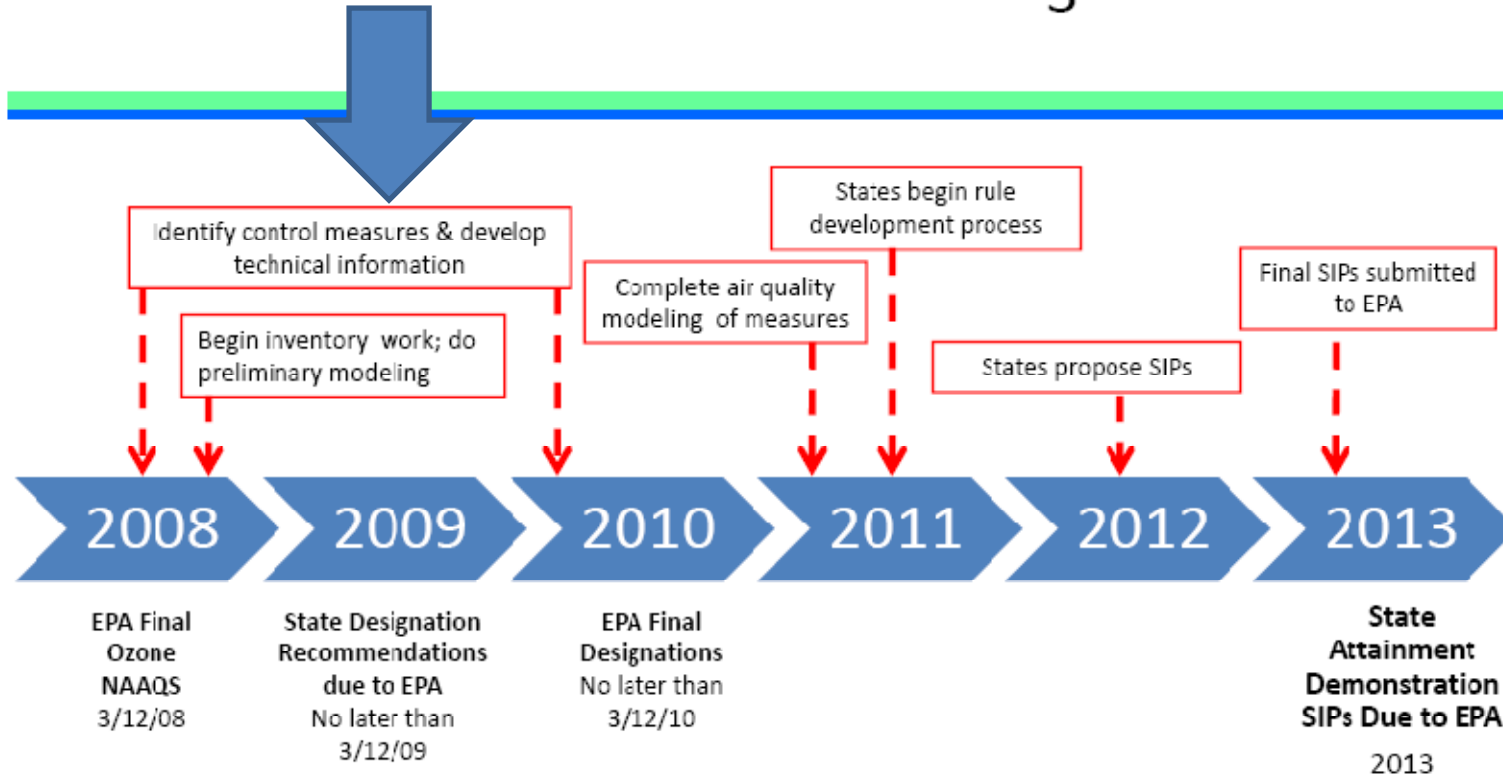
Moderate  
Attainment: 2016

Serious  
Attainment: 2019

\*Non OTC state recommendations  
unverified



# SIP Timeline for New O<sub>3</sub> NAAQS



2008 Ozone NAAQS Attainment Dates 2013 - 2030

	2009				2010				2011				2012				
	Q1 Jan-Mar	Q2 Apr-Jun	Q3 Jul-Sep	Q4 Oct-Dec	Q1 Jan-Mar	Q2 Apr-Jun	Q3 Jul-Sep	Q4 Oct-Dec	Q1 Jan-Mar	Q2 Apr-Jun	Q3 Jul-Sep	Q4 Oct-Dec	Q1 Jan-Mar	Q2 Apr-Jun	Q3 Jul-Sep	Q4 Oct-Dec	
<b>OTC Ozone Process</b>	Identify control measures and develop technical information; screening modeling begins asap				Screening modeling of measures; work on additional measures if needed				Inventory update work concludes and SIP quality modeling of measures occurs				State rule development				State submits SIP
	1st pkg of rec measures		2nd pkg of rec measures		Work on technical support document for measures and modeling (TSD)				Completion of TSD (measures & modeling)								
<b>State PM2.5 Process</b>	Identify control measures and develop technical information; screening modeling begins asap				Inventory work concludes and SIP quality modeling of measures occurs				State rule development				State submits SIP				
				PM rec measures	Work on TSD for measures & modeling		Completion of TSD (measures & modeling)										
<b>Screening Inventory Development</b>	Develop base year		Develop Projection year		Submit all inputs in Jan												
<b>SIP Quality Inventory Development</b>	Develop base year inventory (2005 improvements and/or 2008) for all pollutants for met/modeling year: 2007						Develop Projection year	Oct – All Inputs	Revise inventory information as appropriate for ozone modeling								
<b>Screening Modeling</b>	Develop 2007 meteorological data with UMD/contract assistance			Base case & 40% runs		Base & Control runs											
<b>SIP Quality Modeling</b>	Develop 2007 meteorological data with UMD/contract assistance						PM runs			O3 runs							

# Part II:

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- Air Quality in the OTR
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  - Stationary Area Source Committee
    - Costs and emissions reductions
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# Stationary and Area Source

NOx Measure	State Rules	National Measure	Emissions Reduction	Cost
Boilers serving EGUs	DE, NJ, MA, MD	*	413 TPD OTR	\$1,100 - 8,700 per ton
New Small Gas Boilers	CA, TX	*	53 TPD OTR	\$3,300 to \$16,000 per ton
Municipal waste incinerators	NJ, MD	*	14 TPD OTR	\$2,140 per ton (SNCR)
HEDD EGUs	NJ	*	TBD	\$45,000 to \$300,000 per unit
Stationary Generator Regulation (DG)	DE, MA, MD, NJ	*	TBD	\$39,700 to \$79,700 per TPD
Minor New Source Review	DE, CT, MD, MA, NJ, RI	*	TBD	\$600 to \$18,000 per ton
Energy security / Energy efficiency	TBD	*	TBD	TBD

# Stationary and Area Source

VOC Measure	State Rules	National Measure	Emissions Reduction	Cost
AIM rule	CA	*	50 TPD OTR	\$2,240 per ton
Auto Refinishing	CA	*	21 TPD OTR	\$2,860 per ton
Consumer Products 2006	CA	*	19 TPD OTR	\$7,700 per ton
Lower VOC Solvent Degreaser	MD, CA	*	13 TPD OTR	\$1,400 per ton
Gas Stations	TBD	*	TBD	TBD
Large VOC Storage Tanks	MD, NJ	*	TBD	\$2,288 to \$29,000 per ton
Minor New Source Review	DE, CT, MD, MA, NJ, RI	*	TBD	TBD

# Boiler Strategy NOx Reductions

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- Boilers
  - Boilers Serving EGUs
    - Performance standards for boilers at EGU facilities
  - Strategy for New Small Gas Boilers
    - Ultra Low NOx Burners (ULNB)
  - Non EGU ICI Boiler National Recommendation
    - Fuel and size specific standards for non-EGU boilers

# Boilers Serving EGUs

Table 1: Proposal for NO<sub>x</sub> Emission Rates for Boilers serving EGUs

<u>Source</u>	<u>Type of Fuel</u>	<u>lb/MWh</u>	<u>lb/MMBtu</u>	<u>Averaging time</u>
Boilers serving EGUs	Natural Gas	1.0	0.10	24-hour daily
	No. 2 and lighter Oil	1.0	0.10	24-hour daily
	Heavier than No. 2 Oil	2.0	0.20	24-hour daily
	Coal	1.5	0.15	24-hour daily

Table 2: Emissions Reduction Estimate

<u>2007 NO<sub>x</sub> Emissions (tons)</u>	<u>Emissions w/Performance Standards (tons)</u>	<u>Reduction (tons)</u>	<u>Reduction (%)</u>
<i>Annual Emissions</i> 356,848	205,846	151,101	42
<i>Ozone Season Emissions</i> 113,300	69,177	44,128	39

# Industrial, Commercial and Institutional (ICI) Boilers

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Emissions limitations (performance-based)

- National recommendation in development
- Specific to ***boiler sizes*** and ***fuel types***,
- Public briefing at Feb 2009 Committee Meeting
- Working on Technical Support Document to Present to the USEPA



# Strategy for New Small Gas Boilers

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- Ultra Low NOx Burners (ULNB)
  - steam generators, process heaters, and water heaters
  - San Joaquin Valley Rule 4308
    - 75,000 Btu/hr to 2.0 million Btu/hr
  - San Joaquin Valley 4307
    - 2.0 million Btu/hr to 5.0 million Btu/hr

# Potential Reductions from Boiler Strategies

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Estimated NOx tons per year reductions from OTR and national recommendations:

– Boilers serving EGU	151,000
– ICI national recommendation (oil / gas area)	49,000
– ICI national recommendation (oil / gas point)	24,000
– New Small Gas Boilers	19,000
– <u>ICI national recommendation (coal point)</u>	<u>10,000</u>
– Boilers total in OTR	254,000
– Goal Reduction 40% in OTR	500,000

# Mobile Sources: Potential Measures

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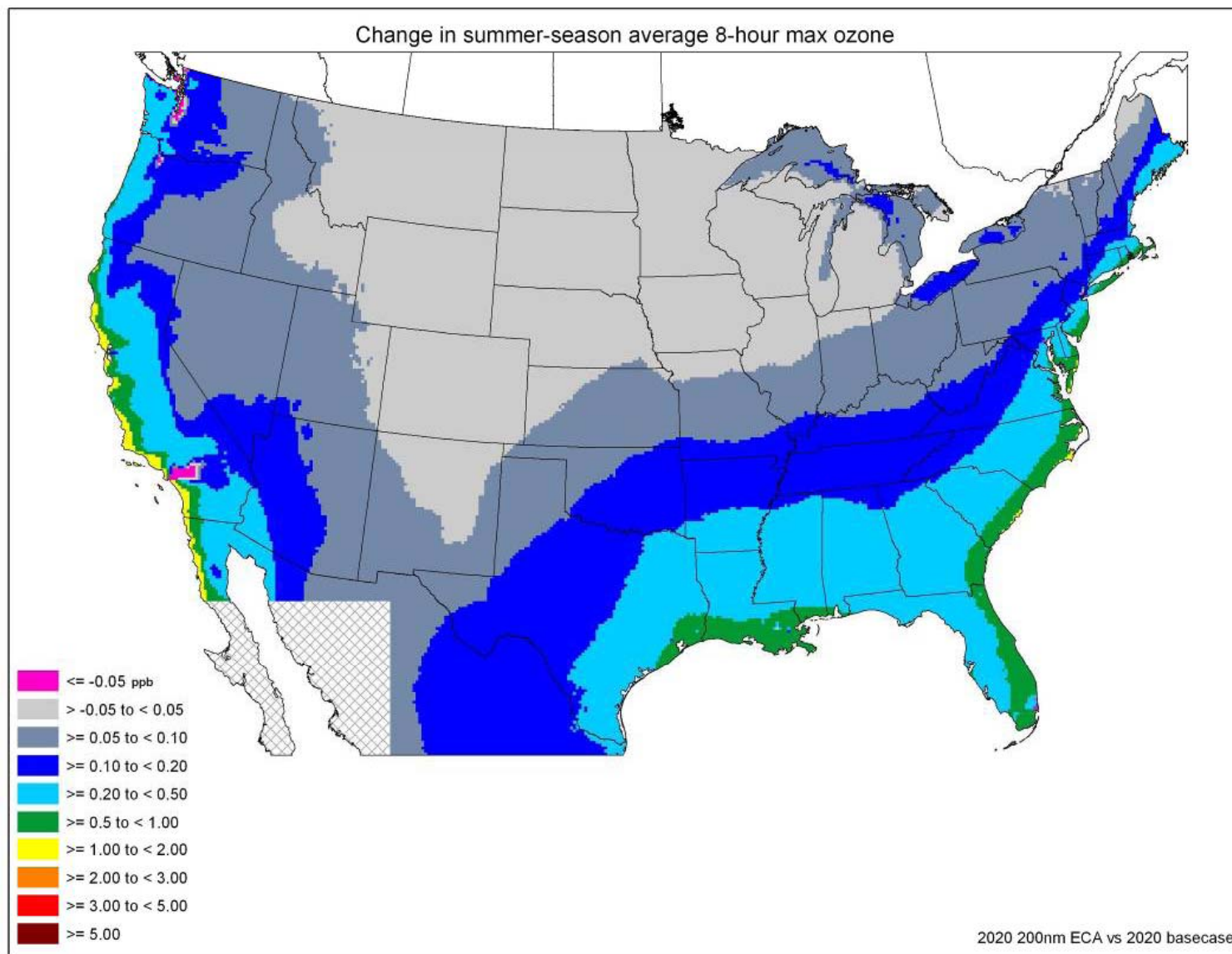
- Potential national measures
  - Letter of support for the ocean going vessels Emission Control Areas (ECA) designation
  - Concern Regarding Backsliding in Renewable Fuel Standard (RFS) Part II
  - Aftermarket Catalyst Replacement Standards
- Measures for further OTC and NESCAUM development
  - Off shore lightering for ships
  - Sea ports
  - Non-Road idling
  - Regional fuels
  - Heavy duty diesel
  - Vehicle miles traveled (VMT)

# Oceangoing Vessels

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- USEPA & IMO Emission Control Areas (ECA)
  - International Maritime Organization (IMO) Action (March 2010)
    - NOx and SO2 requirements on ship near shore
      - 2015 – 1000 ppm Maximum Sulfur Fuel
      - 2016 – New Engine Standards – Tier 3 (80% reduction)
    - Existing Engines – (starting 2010) 15 – 20% NOx reductions
- OTC action
  - Letter of support for the USEPA and IMO Action - March 13, 2009

# Improvement in Summertime Average 8-hour Average Ozone Concentrations in 2020 Resulting from the Proposed Emission Control Area



# Renewable Fuel Standard

## Part II

- Energy Independence and Security Act (December 2007) Required Changes
  - Increase volume of renewable fuel
  - Separate Requirements for:
    - Cellulosic Biofuel – 16 billion gallons by 2022
    - Biomass-Based Diesel – 1 billion gallons by 2012
    - Advanced Biofuel – 21 billion gallons by 2022
    - Total Renewable Fuel – 36 billion gallons by 2022
  - Minimum Lifecycle GHG reductions

# Renewable Fuel Standards

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- EPA RFS 2
  - Proposed May 5th
  - Renewable fuel requirements starting in 2010
- OTC is concerned about increased emissions
  - Projected NOx increased by 2022
    - 241,00 tons from upstream production
    - 71,000 tons from downstream use
  - Projected hydrocarbon (VOC) increase by 2022
    - 77,000 tons from upstream production
    - 35,000 tons from downstream use
- Need to address possible backsliding



## Program Impacts: Emissions

Pollutant	Change in total U.S. inventory <sup>1</sup> in 2022 in comparison to RFS1 mandate
NO <sub>x</sub>	2.5 to 3.0%
HC	0.3%
PM <sub>10</sub>	1.0%
PM <sub>2.5</sub>	0.3%
CO	-3.1 to -5.8%
Ethanol	29 to 33%
Acetaldehyde	28 to 38%
Benzene	-1.5 to -3.5%
GHG	-150 to -160 million tons per year on average (over 30 to 100 years respectively)

<sup>1</sup> Includes all upstream and downstream emissions



# Aftermarket Catalyst Replacement

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- Current Federal EPA Standard (1986)
  - 25,000 mile durability requirement
  - 30% NOx reduction
- California requirements
  - 50,000 mile durability requirement
  - Vehicle certification emission standards (60% - 85% NOx reduction) with additional hydrocarbon requirements
  - Estimated cost increase above today's pre-OBD converter of \$200 per converter
  - Benefits: at least 282 TPD NOx reduction nationally

# News

THE STAR-LEDGER – Thursday May 28, 2009

## LAW & ORDER

### Converters stolen from used car lot

**LINDEN:** Thieves stole catalytic converters from nine vehicles at a Linden lot over Memorial Day weekend, police said yesterday.

The manager of Karl Motors, a used car dealer on East Elizabeth Avenue told police that a thief sawed nine catalytic converters off vehicles in his lot. The converters are valued at \$800 each, according to a Linden police department release.

Earlier this month, eight catalytic converters were stolen from vehicles in an East Linden Avenue shipping company lot.

Police said there are no suspects at this time. Police are asking anyone with information on the case to call Detective Frank A. Leporino at 908-474-8535.

# Next Steps

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- Continue to work on developing the strategies
- Hold a public joint Committee meeting in late summer early fall for the:
  - Stationary and Area Source Committee
  - Mobile Source Committee
  - Modeling Committees
- Continue to seek stakeholder input in strategy development
- AQ screening / sensitivity analysis