

# Review of Midwest Air Quality

Michael Koerber

Lake Michigan Air Directors Consortium

October 27, 2010

# Air Pollutants of Concern

- Criteria Pollutants
  - Ozone, PM<sub>2.5</sub>, PM<sub>10</sub>, lead, NO<sub>2</sub>, SO<sub>2</sub>, CO
- Hazardous (Toxic) Air Pollutants
  - Benzene, xylene, toluene, 1,3-butadiene, styrene, ...
- Other
  - Atmospheric deposition – mercury, nitrogen, sulfur
  - Regional haze
  - Greenhouse gases

# Current Schedule for Ongoing NAAQS Reviews (Sept 2010)

MILESTONE	POLLUTANT						
	NO <sub>2</sub> Primary	SO <sub>2</sub> Primary	Ozone Reconsideration	CO	PM	NO <sub>2</sub> /SO <sub>2</sub> Secondary	Lead
NPR	<u>Jun 26, 2009</u>	<u>Nov 16, 2009</u>	Jan 6, 2010	<u>Jan 28, 2011</u>	Feb 2011	<u>July 12, 2011</u>	Nov 2013
NFR	<u>Jan 22, 2010</u>	<u>Jun 2, 2010</u>	Oct 29, 2010	<u>Aug 12, 2011</u>	Oct 2011	<u>Mar 20, 2012</u>	Sept 2014

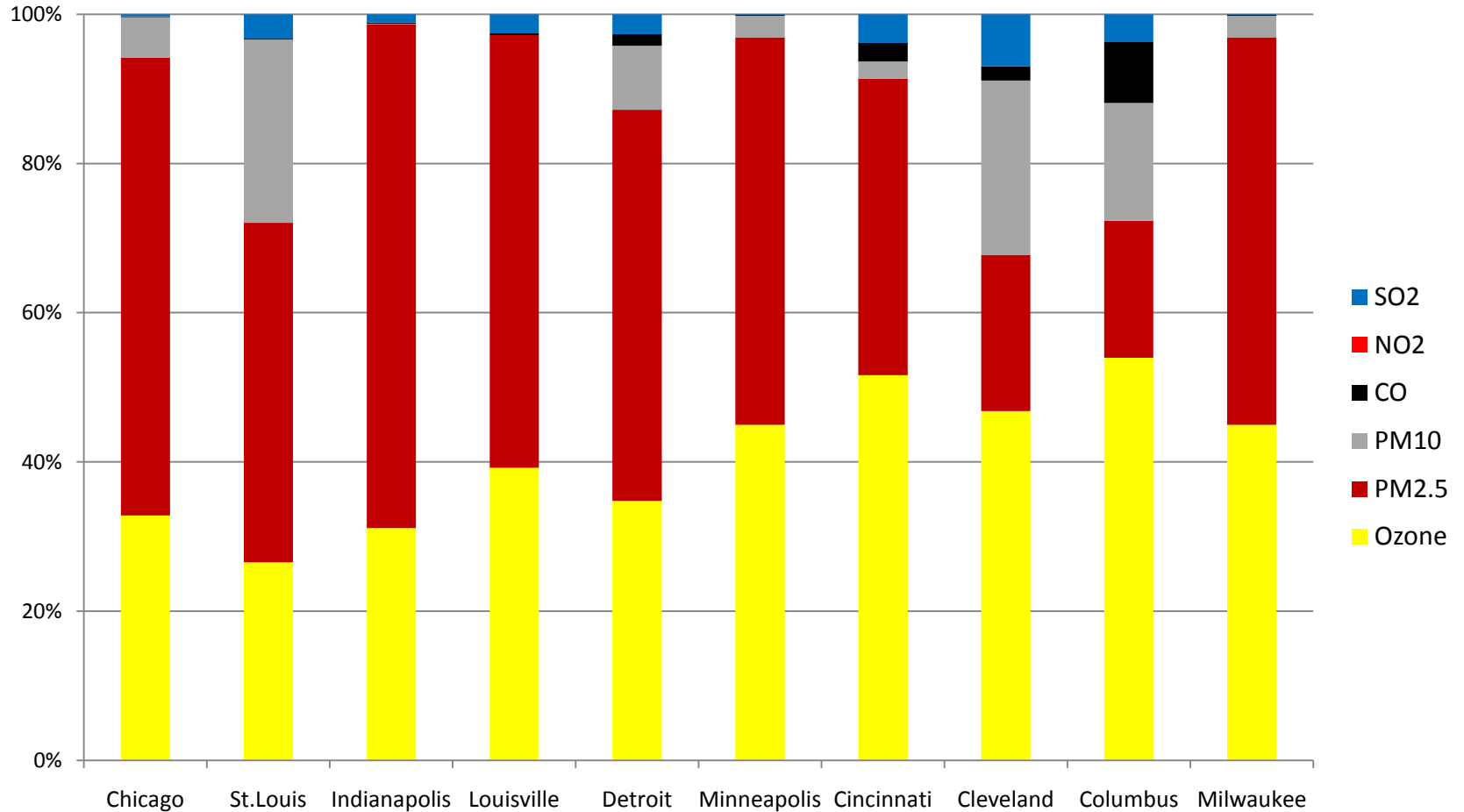
NOTES:

- Underlined dates indicate court-ordered or settlement agreement deadlines
- Next Ozone Review: Proposal in Jun 2013 and Final in Mar 2014
- More information about all ongoing reviews available at: <http://www.epa.gov/ttn/naaqs/>

# Anticipated NAAQS Implementation Milestones

Pollutant	NAAQS Promulgation	Designations Effective (approximate date)	110(a) SIPs Due (3 yrs after NAAQS promulgation)	Attainment Demonstration Due	Attainment Date
PM <sub>2.5</sub> (2006)	Sept 2006	Dec 2009	Sept 2009	Dec 2012	Dec 2014/2019
Pb	Oct 2008	Nov 2010/2011 (extra time for new monitors)	Oct 2011	June 2012/2013	Nov 2015/2016
NO <sub>2</sub> (primary)	Jan 2010	Feb 2012	Jan 2013	Aug 2013	Feb 2017
SO <sub>2</sub> (primary)	June 2010	July 2012	June 2013	Jan 2014	July 2017
Ozone (all dates tentative)	Oct/Nov 2010	Late 2011	Late 2013	Spring 2014 (to be proposed)	Late 2017 (Moderate)
CO	Aug 2011	Sept 2013	Aug 2014	Mar 2015	Sept 2018
PM <sub>2.5</sub> (2011)	Oct 2011	Dec 2013	Oct 2014	Dec 2016	Dec 2018/2023
NO <sub>2</sub> /SO <sub>2</sub> Secondary	Mar 2012	Apr 2014	Mar 2015	Oct 2015	N/A

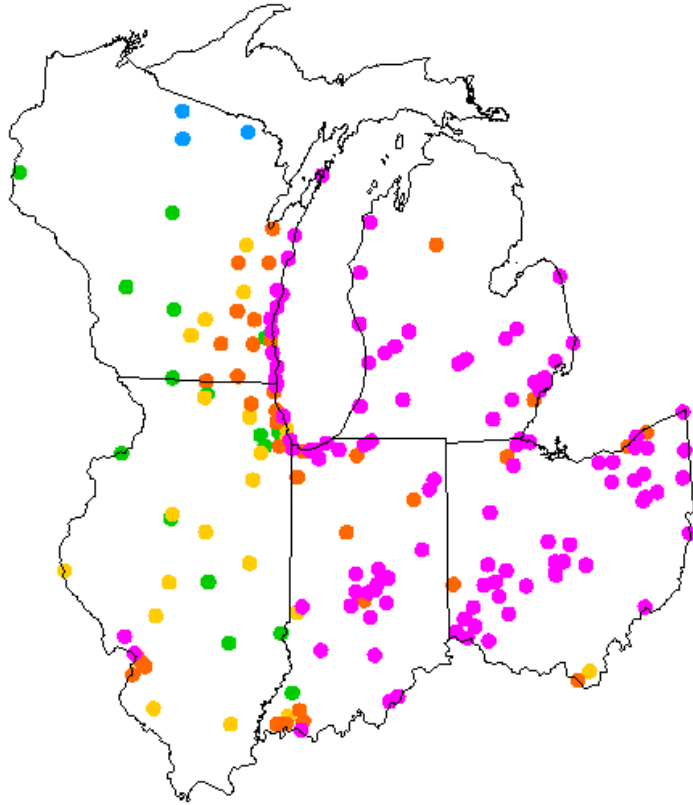
# Air Quality Index: Controlling Air Pollutant



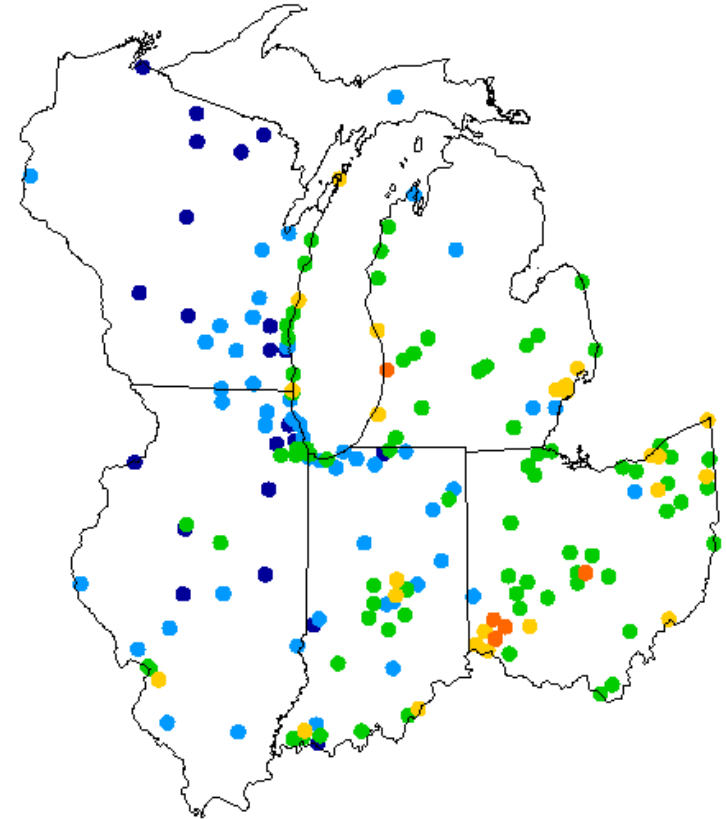
# Ozone

# Ozone Design Values: 8-Hour

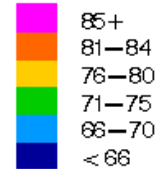
2001-2003



2007-2009



DV, in ppb

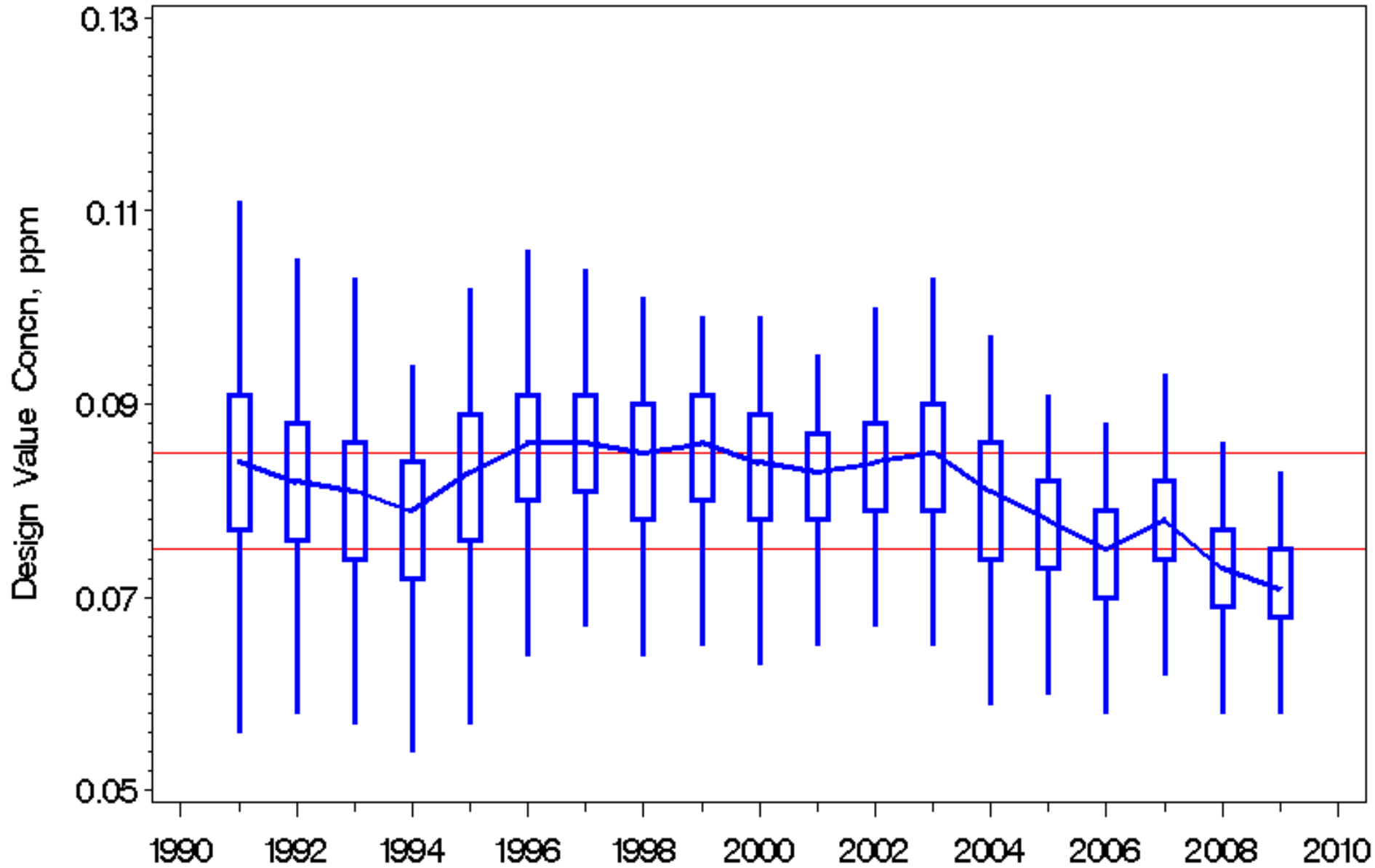


# sites > NAAQS

'01-'03 183

'07-'09 29

# Ozone Air Quality Trends

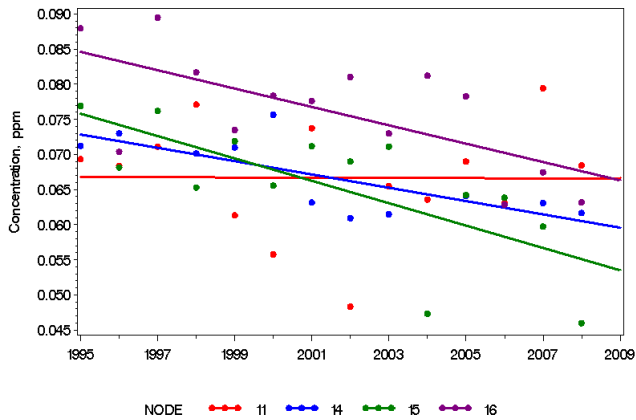


Design value plotted by end year of 3-year period.

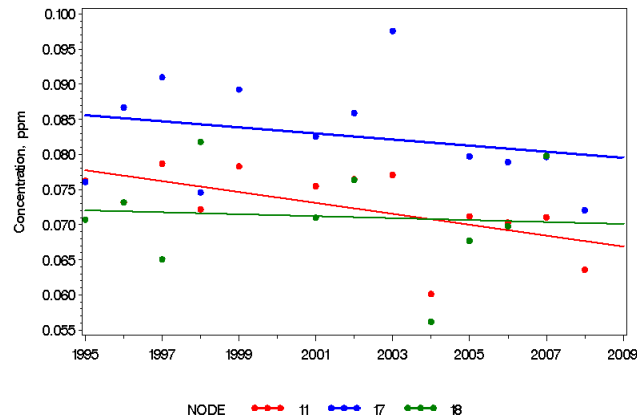


# Meteorologically-Adjusted Ozone Trends

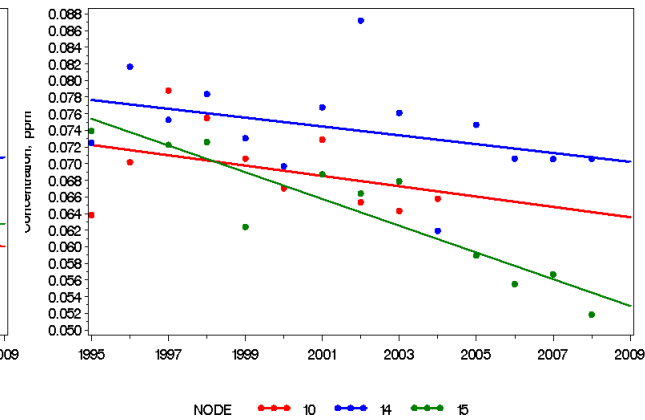
## Chicago



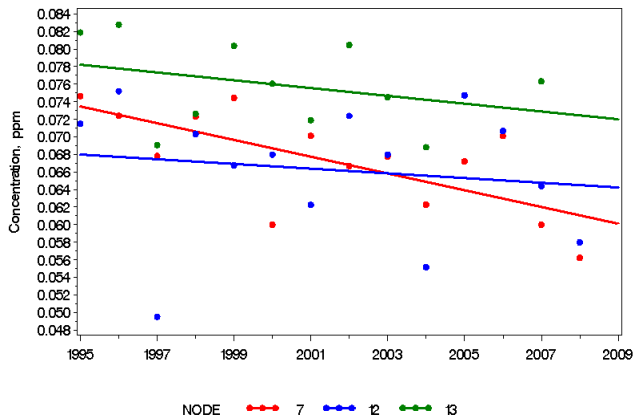
## Detroit



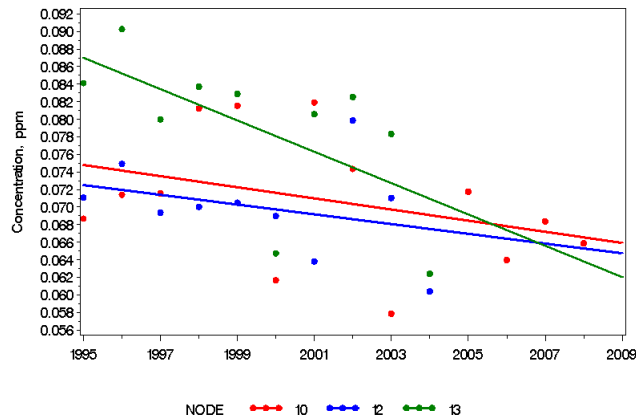
## Cleveland



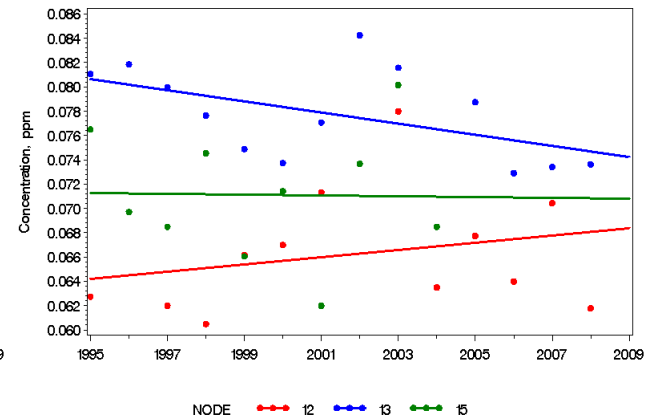
## St. Louis



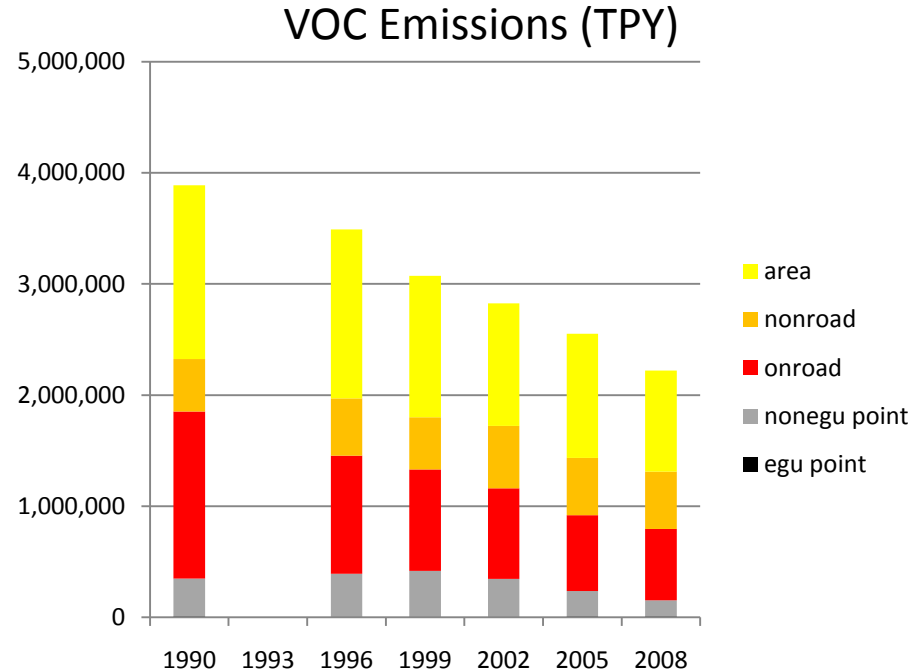
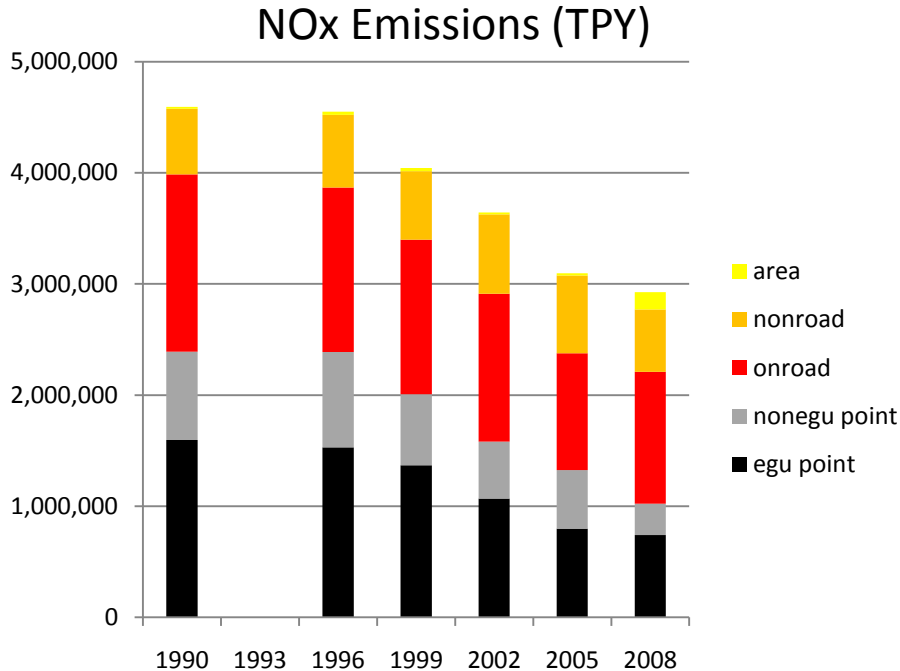
## Indianapolis



## Cincinnati



# Why is ozone getting better?



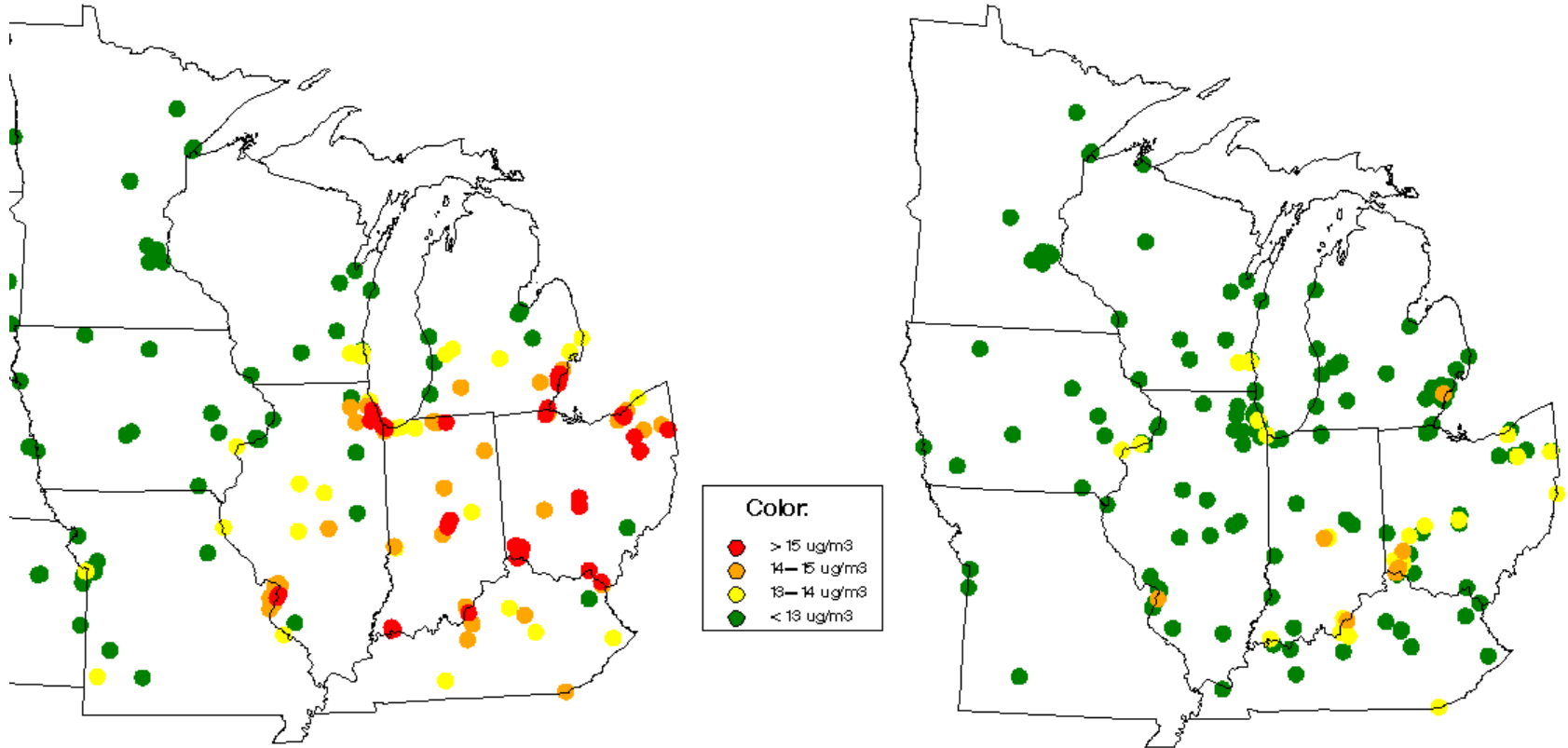
*Emission totals for 5-state LADCO region based on NEI (1990-2005) and draft LADCO 2008*

PM<sub>2.5</sub>

# PM<sub>2.5</sub> Design Value: Annual Standard

2001-2003

2007-2009

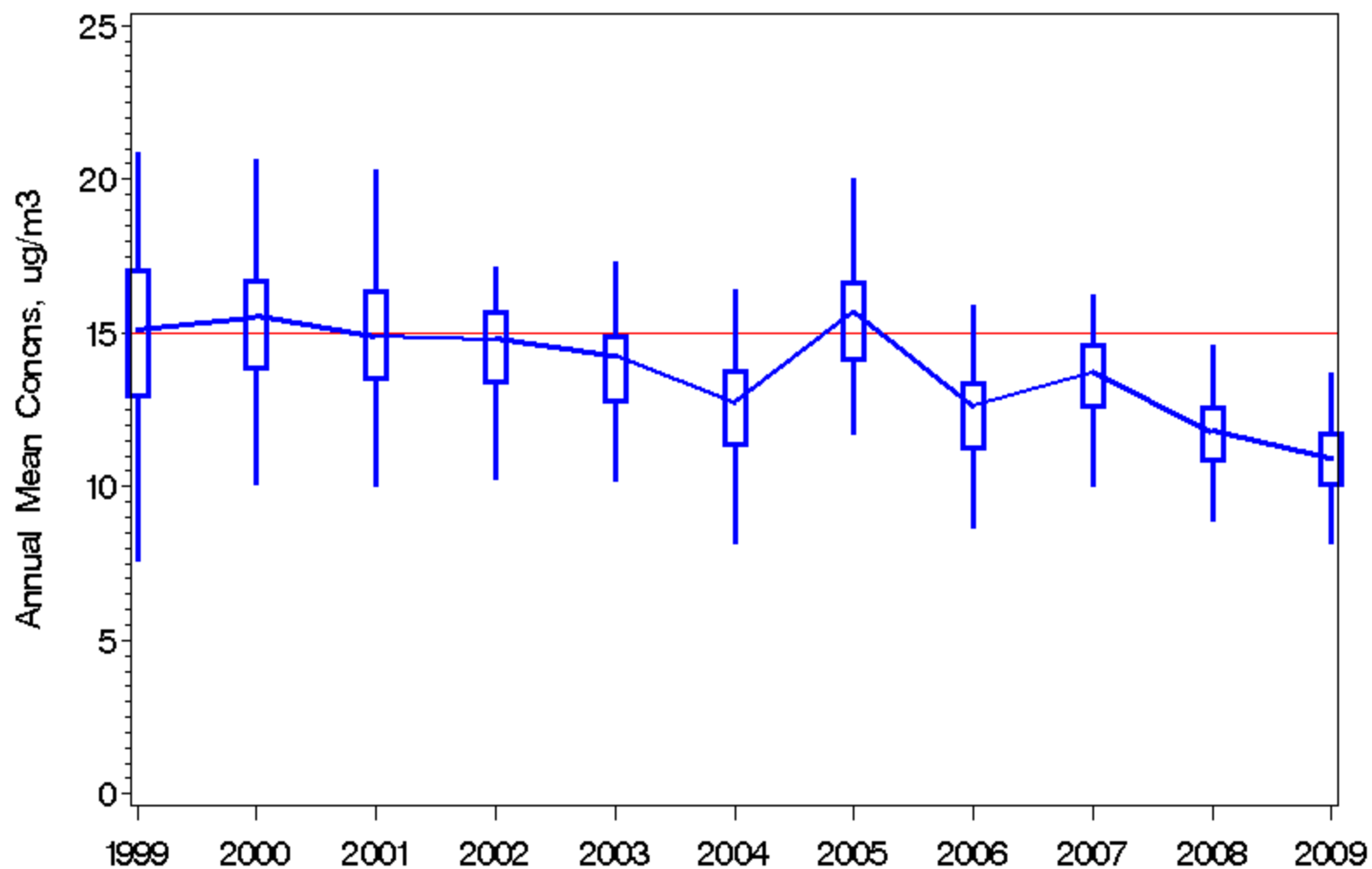


# sites > NAAQS

'01-'03 66

'07-'09 0

## PM2.5 Annual Mean Trends, Midwest States, 1999–2009

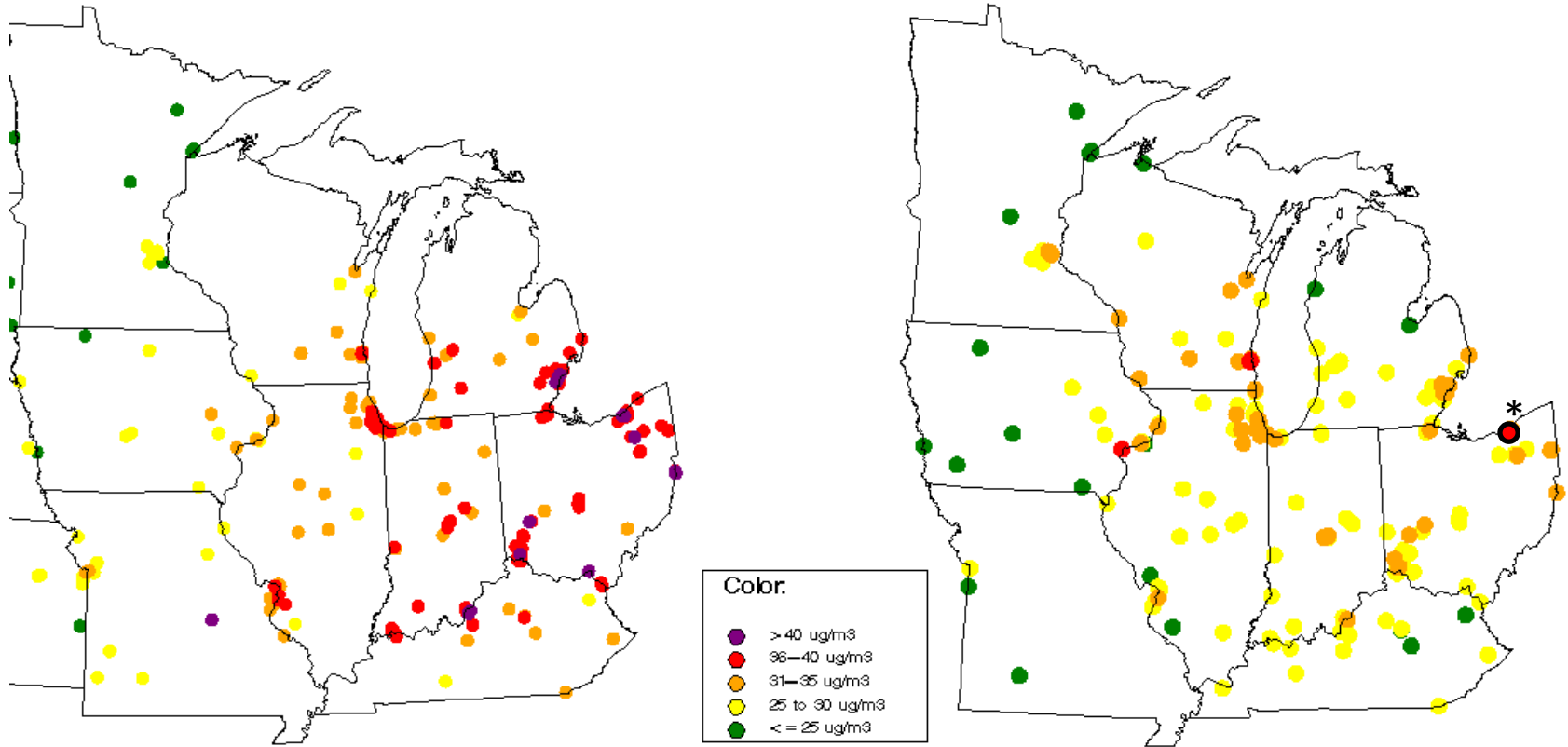


Trends for monitors with at least 8 years of data

# PM<sub>2.5</sub> Design Value: Daily Standard

2001-2003

2007-2009



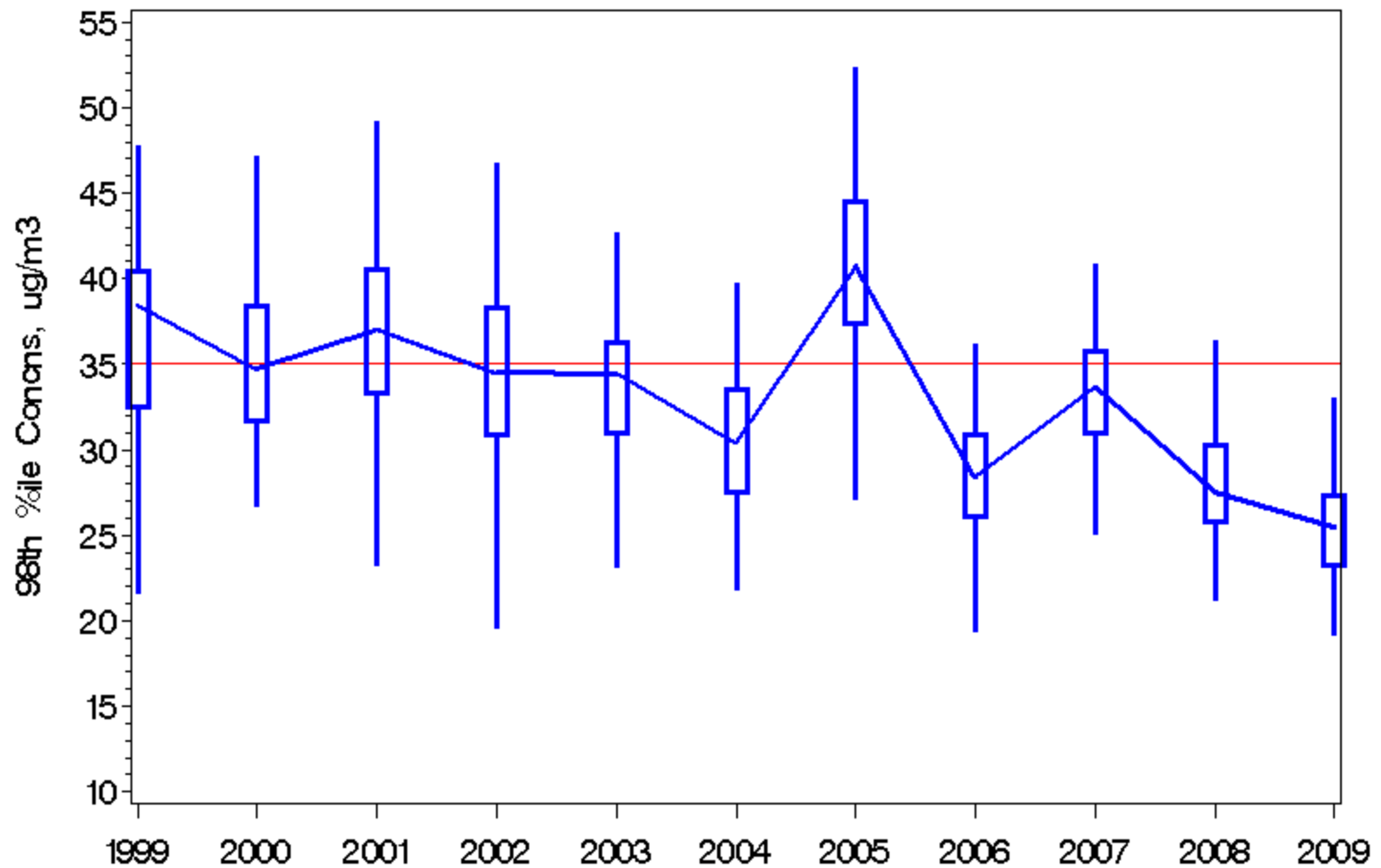
\* = d.v. > 35 ug/m<sup>3</sup>, but incomplete data

## # sites > NAAQS

'01-'03 88

'07-'09 4

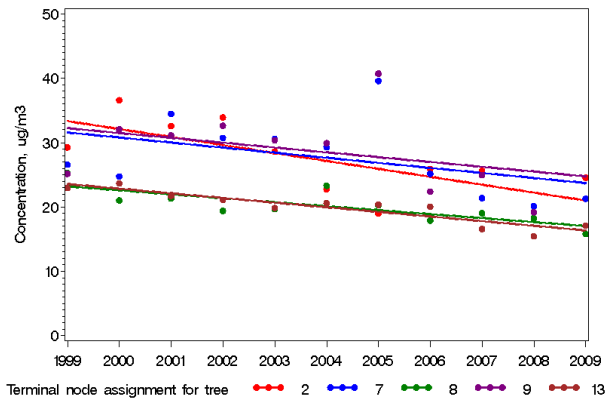
## PM2.5 98th Percentile Trends, Midwest States, 1999–2009



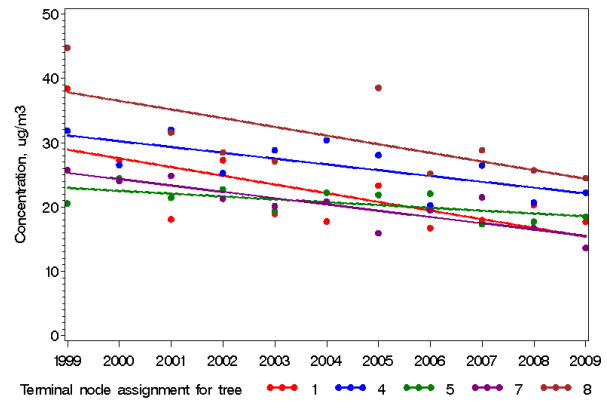
Trends for monitors with at least 8 years of data

# Meteorologically-Adjusted PM<sub>2.5</sub> Trends

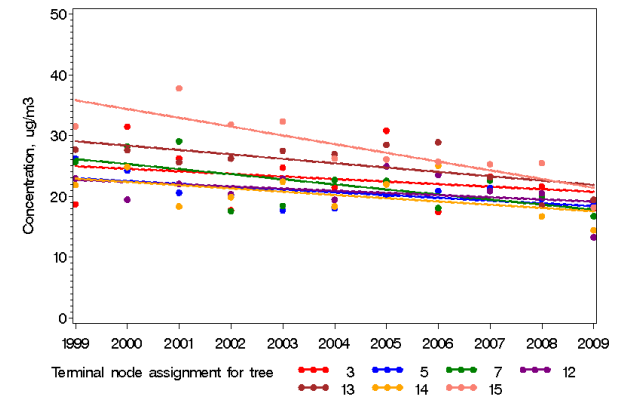
Chicago



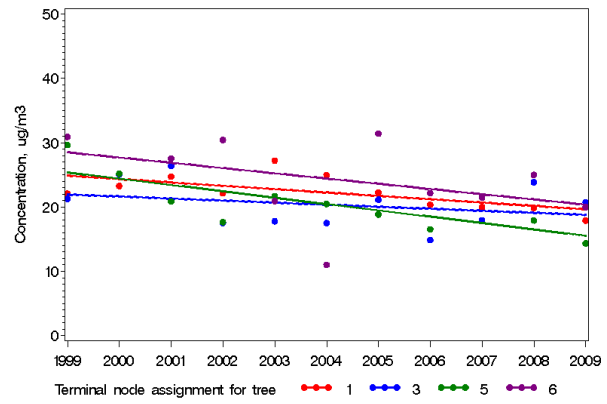
Detroit



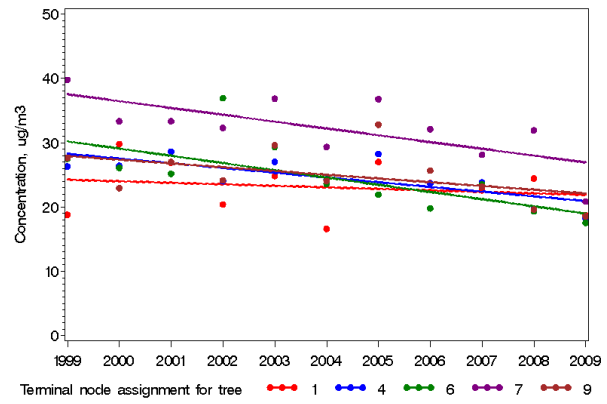
Cleveland



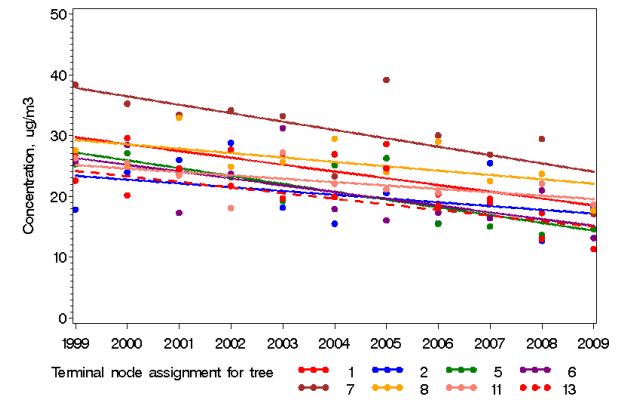
St. Louis



Indianapolis

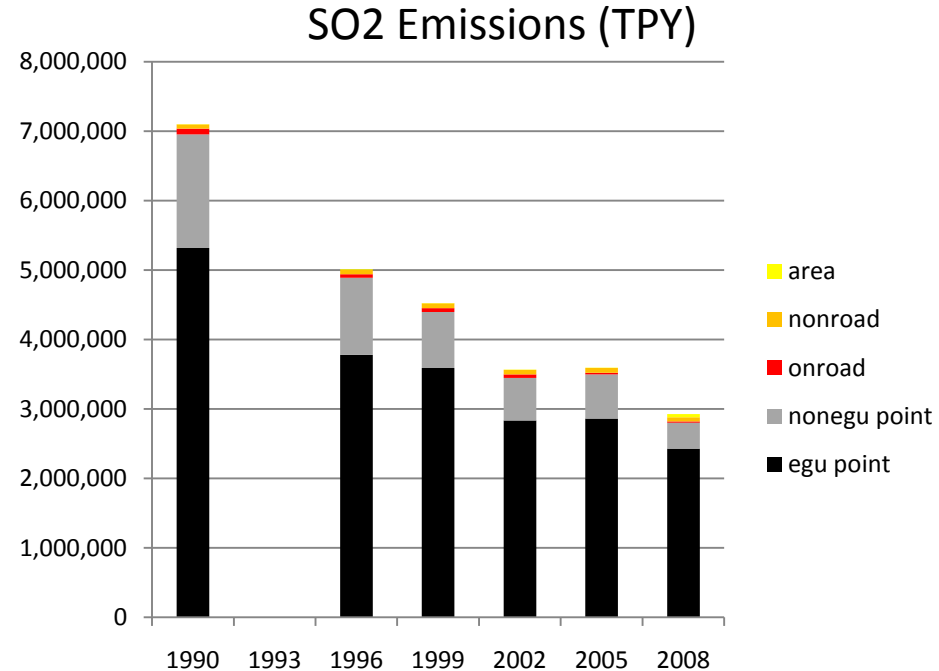
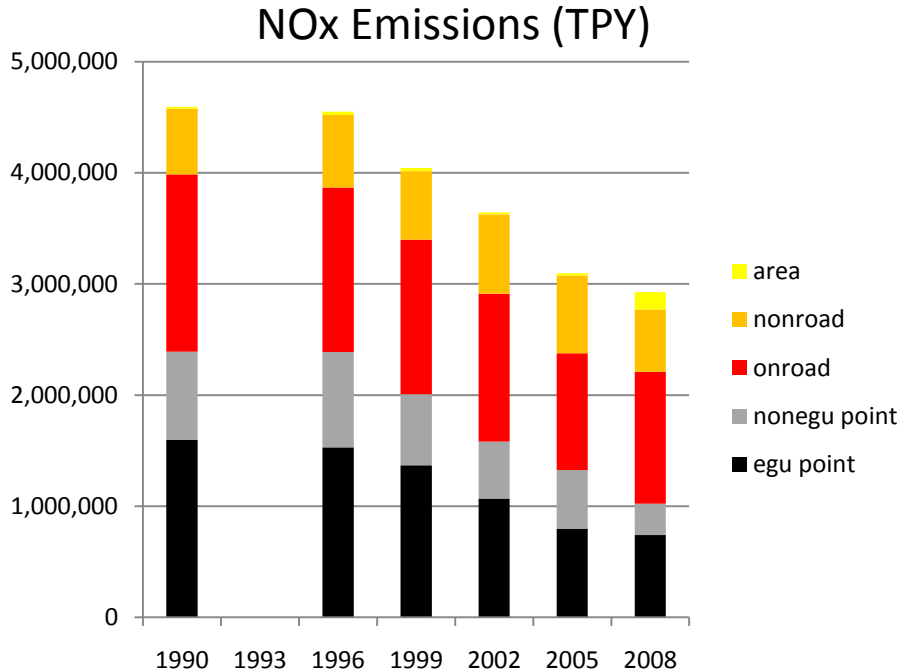


Cincinnati



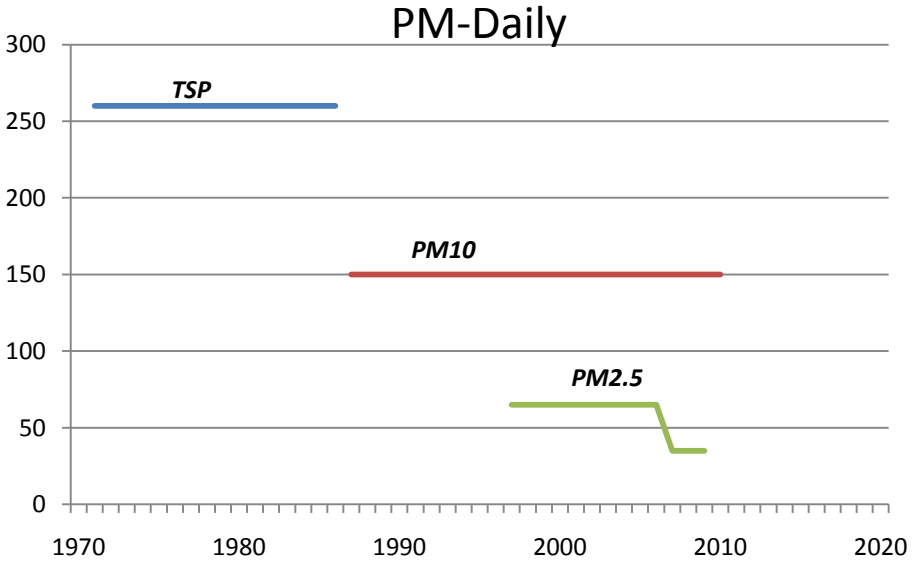
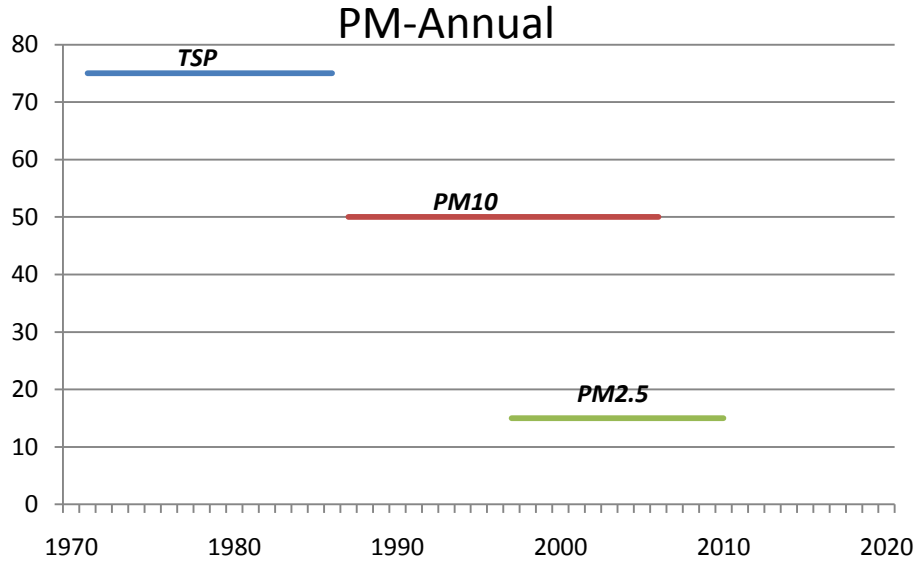
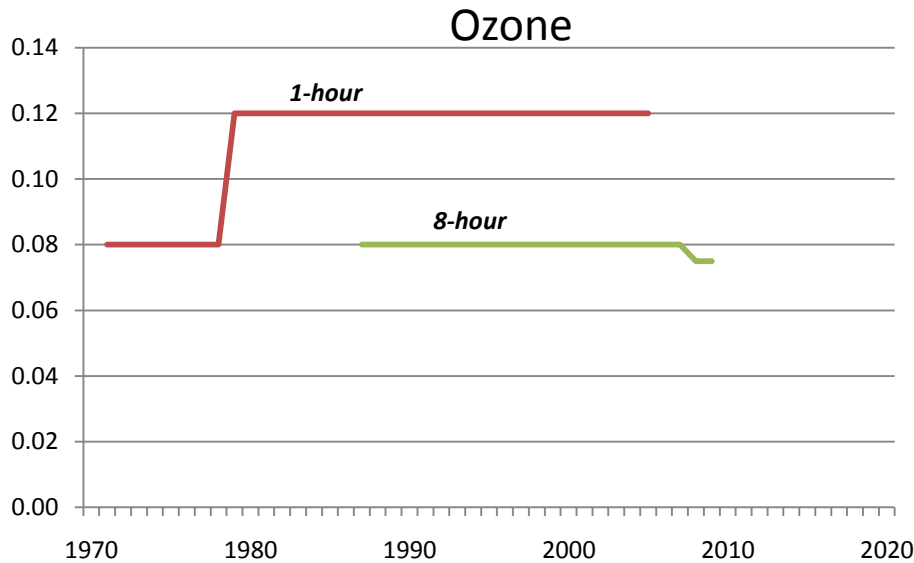


# Why is PM<sub>2.5</sub> getting better?



*Emission totals for 5-state LADCO region based on NEI (1990-2005) and draft LADCO 2008*

# History of NAAQS for Ozone and PM



# Summary

- Air quality has improved
  - Ozone and PM<sub>2.5</sub> levels have declined over past decade
- For current NAAQS, there are a few residual problems
- For new/upcoming NAAQS, expect challenges
  - Near roadway impacts (e.g., NO<sub>2</sub>)
  - Near source impacts (e.g., Pb, SO<sub>2</sub>)
  - Tighter ozone and PM<sub>2.5</sub> standards