

2016 Air Quality Report

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Air Pollution Control Program

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St. Louis University, St. Louis, MO

Presentation Overview

- Emissions Inventory and Trends
 - Point sources and Emissions Reporting
 - NO₂ & SO₂ (point, non-point, mobile)
- Ambient Air Monitoring and Trends
 - PM_{2.5} NAAQS
 - PM_{2.5} Speciation Trends
- Website Resources

Point Source Emissions Reporting

10 CSR 10-6.110 (By Permit Type)

- Part 70- Full Emissions Report- Annually
(potential to emit (PTE) >100 tons per year (tpy) of any criteria pollutants, or 10/25 tpy of HAPs)
- Intermediate- Full- every three years,
otherwise reduced* reporting
(PTE > 100 tpy but accepted an emission limit of less than 100 tpy)
- Small sources-Basic & no operating permit (NOP) -
Full once, reduced* subsequently

Basic: PTE greater than de minimis levels but less than 100 tpy.

NOP DeMPAL: Construction Permit limits actual emissions to be below de minimis levels.

de minimis Levels: PM₁₀ = 15 tons, PM_{2.5} 10 tons, SO_x, NO_x, VOC = 40 tons, CO = 100 tons, Lead = 0.6 tons, HAPs = 10 tons each/25 tons combined)

*Full EIQ is required if 5 tons/year change in emissions or if there is a construction permit action.

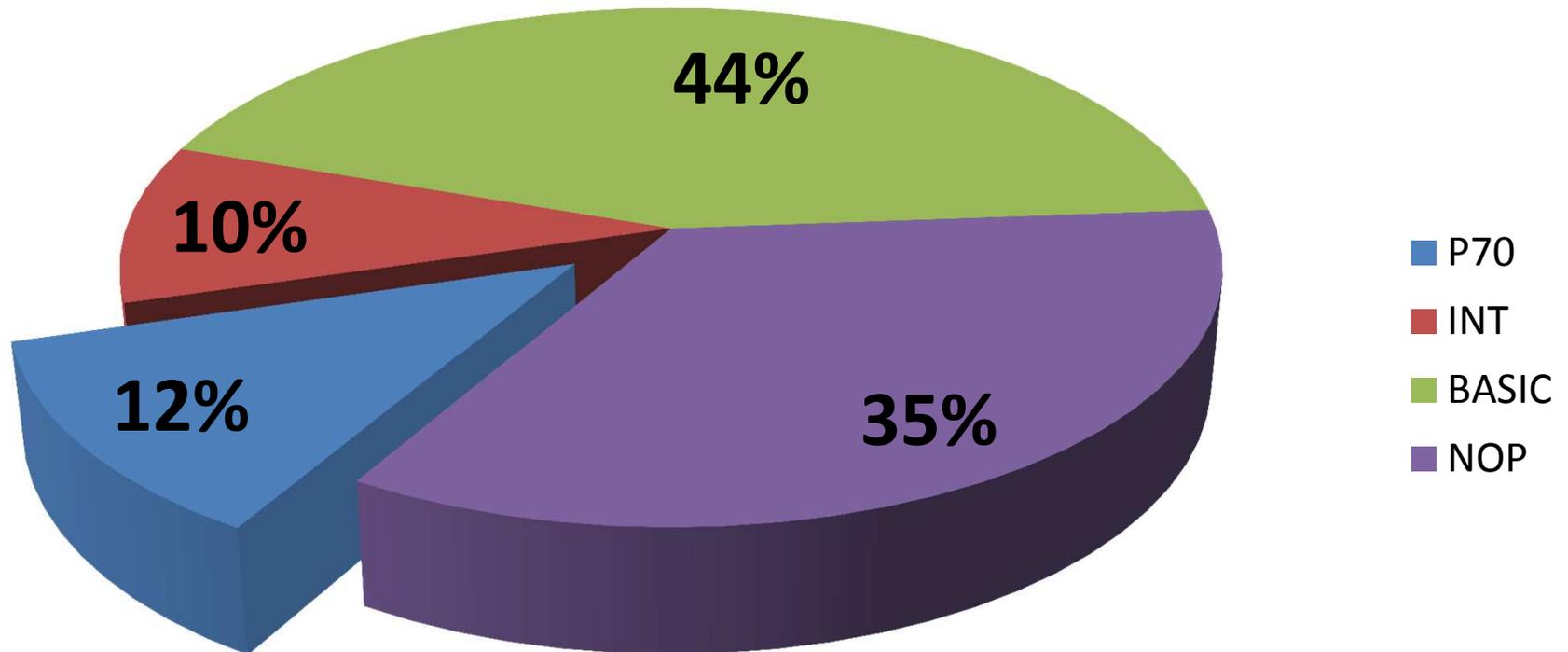
How many point source facilities?

Permit Type	Type of 2014 EIQ (as of mail-out)		Total Number
	Full	Reduced	
Part 70	269	0	269
Intermediate	216	0	216
Basic	219	750	969
No Operating Permit*	162	618	780
All permit types	866	1368	2,234

*Construction permit limits emissions below De Minimis permit applicability limits. (NOP_DeMPAL)

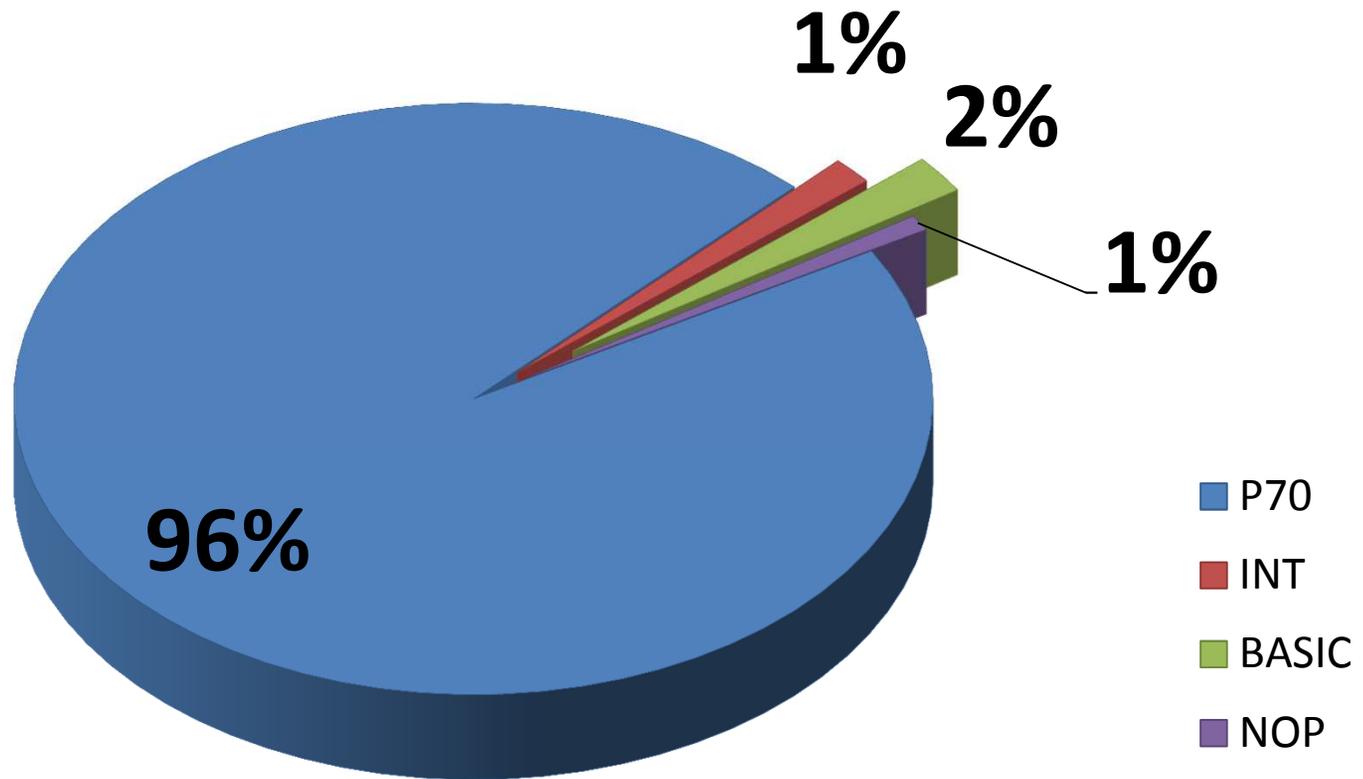


Permit Type as a Percent of Total Facilities 2014 Emissions Year



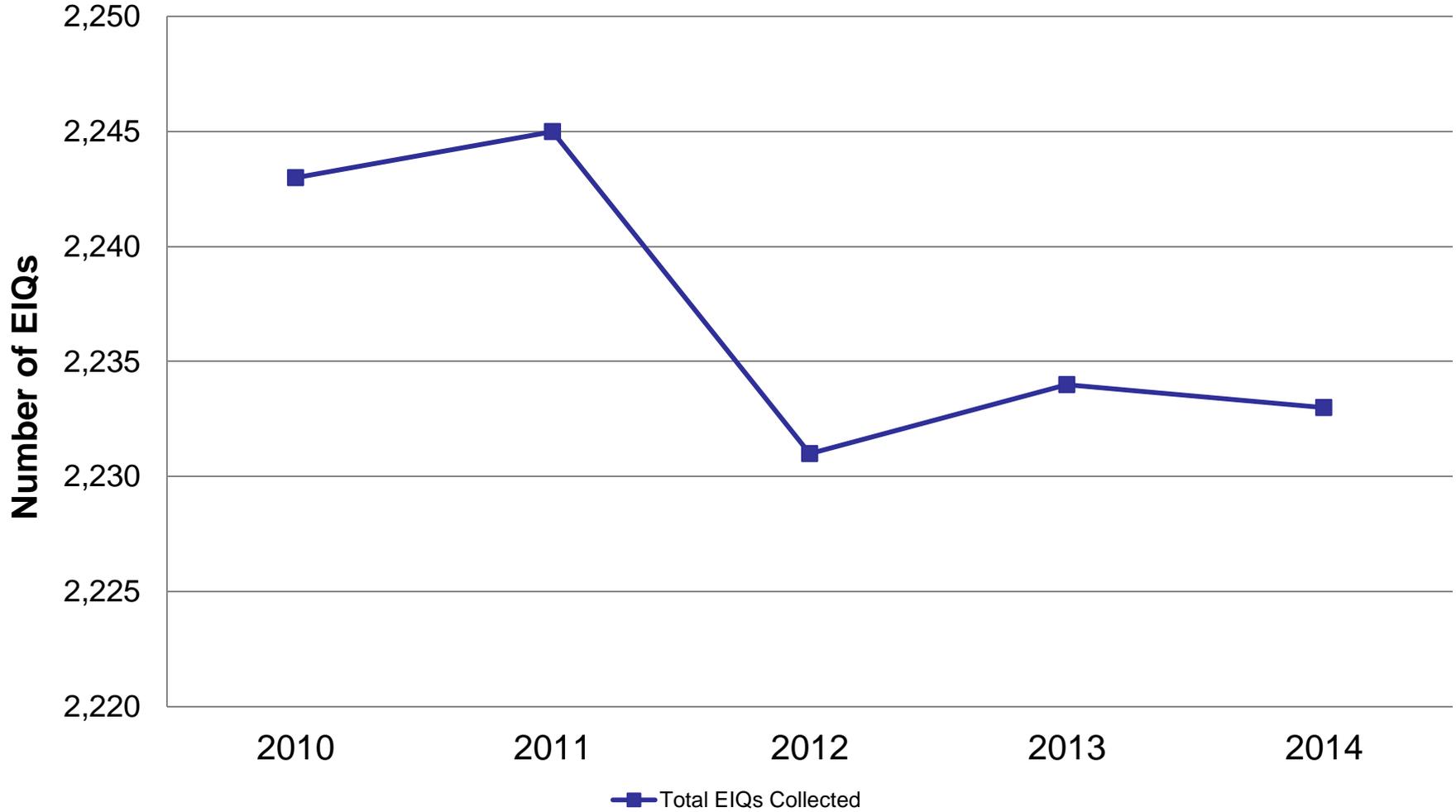


Percent of Total Point Source Emissions by Permit Type 2014 Emissions Year

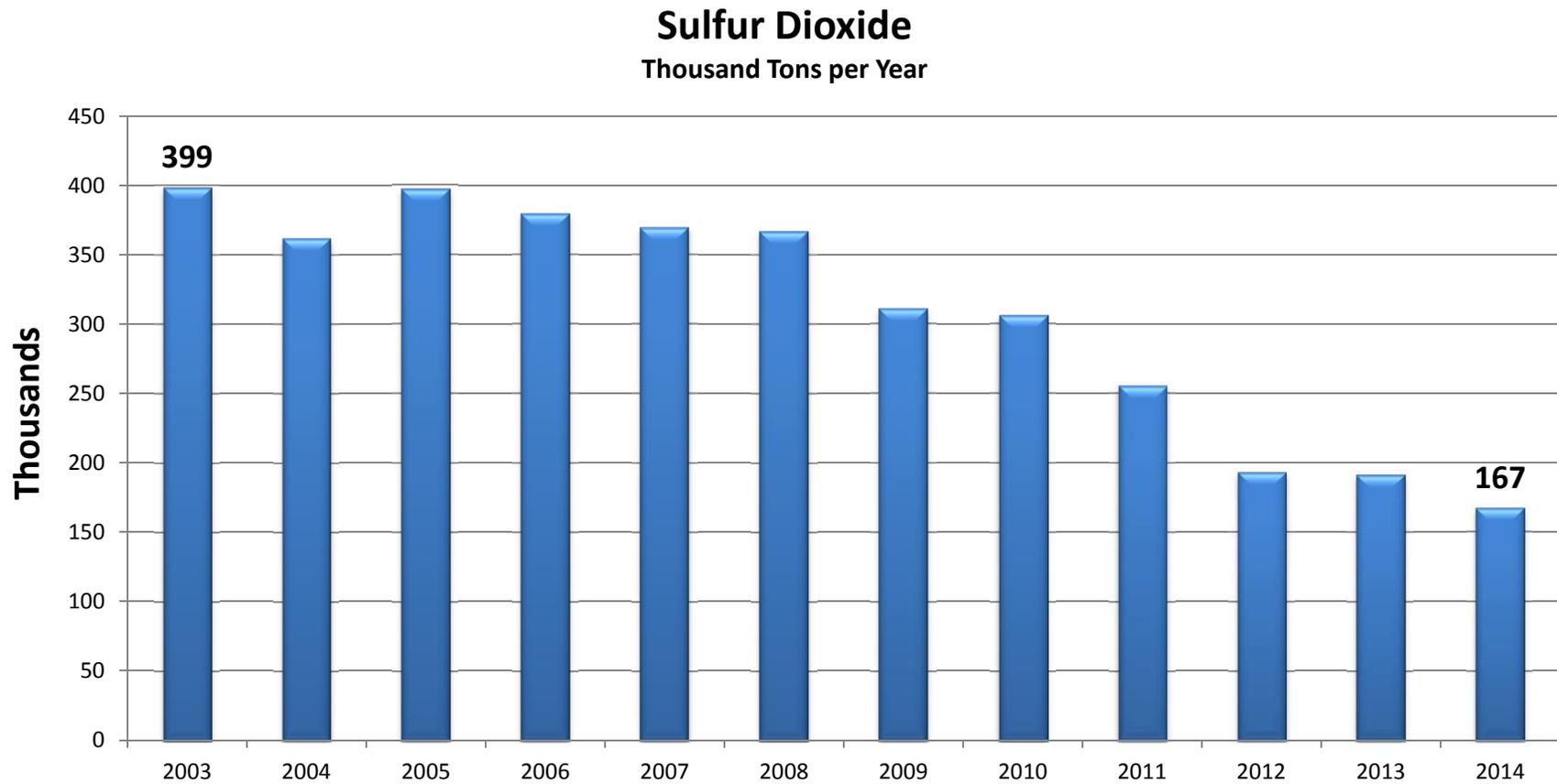




Total EIQs Collected by Year

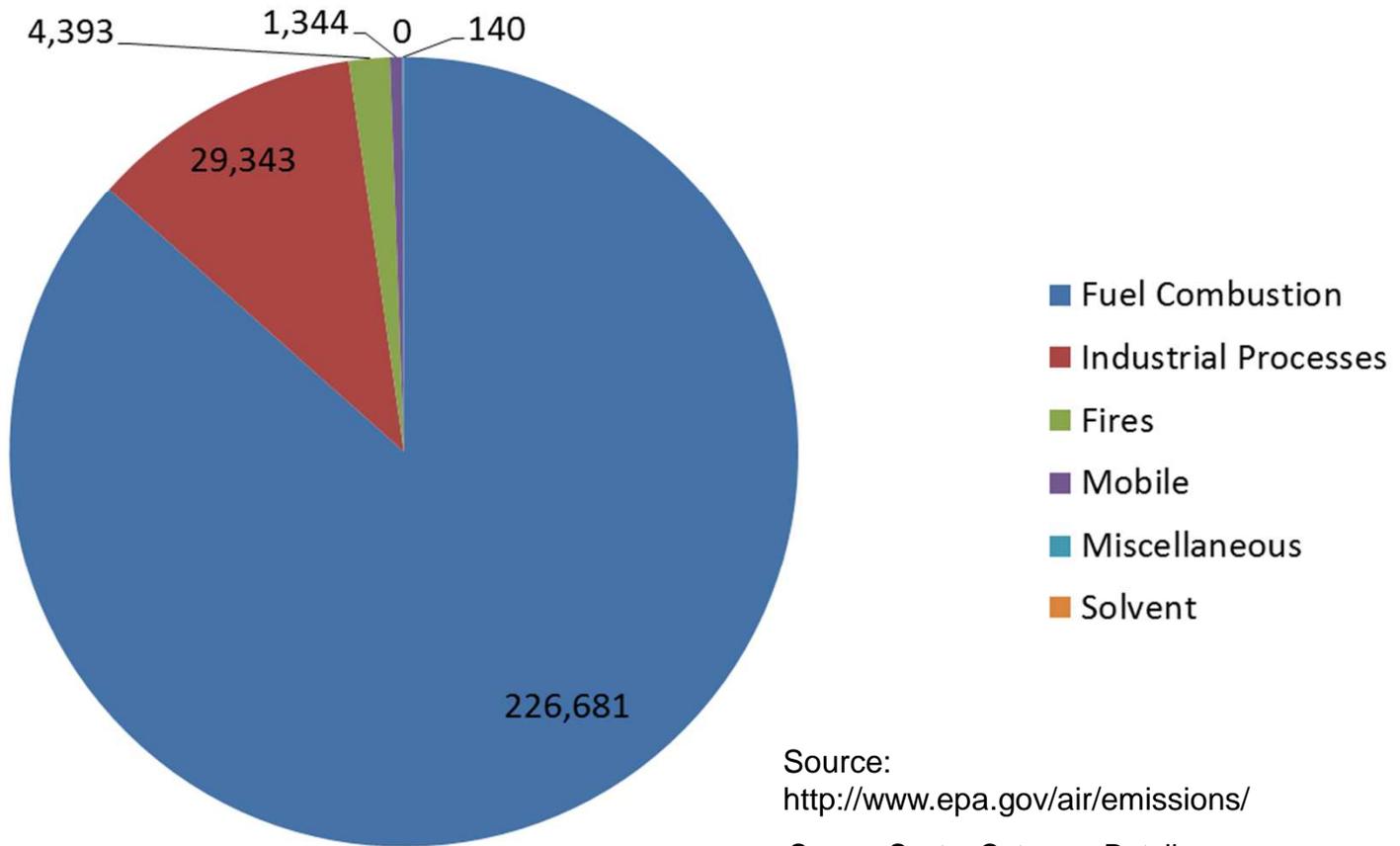


Sulfur Dioxide (SO₂) Point Source Emissions





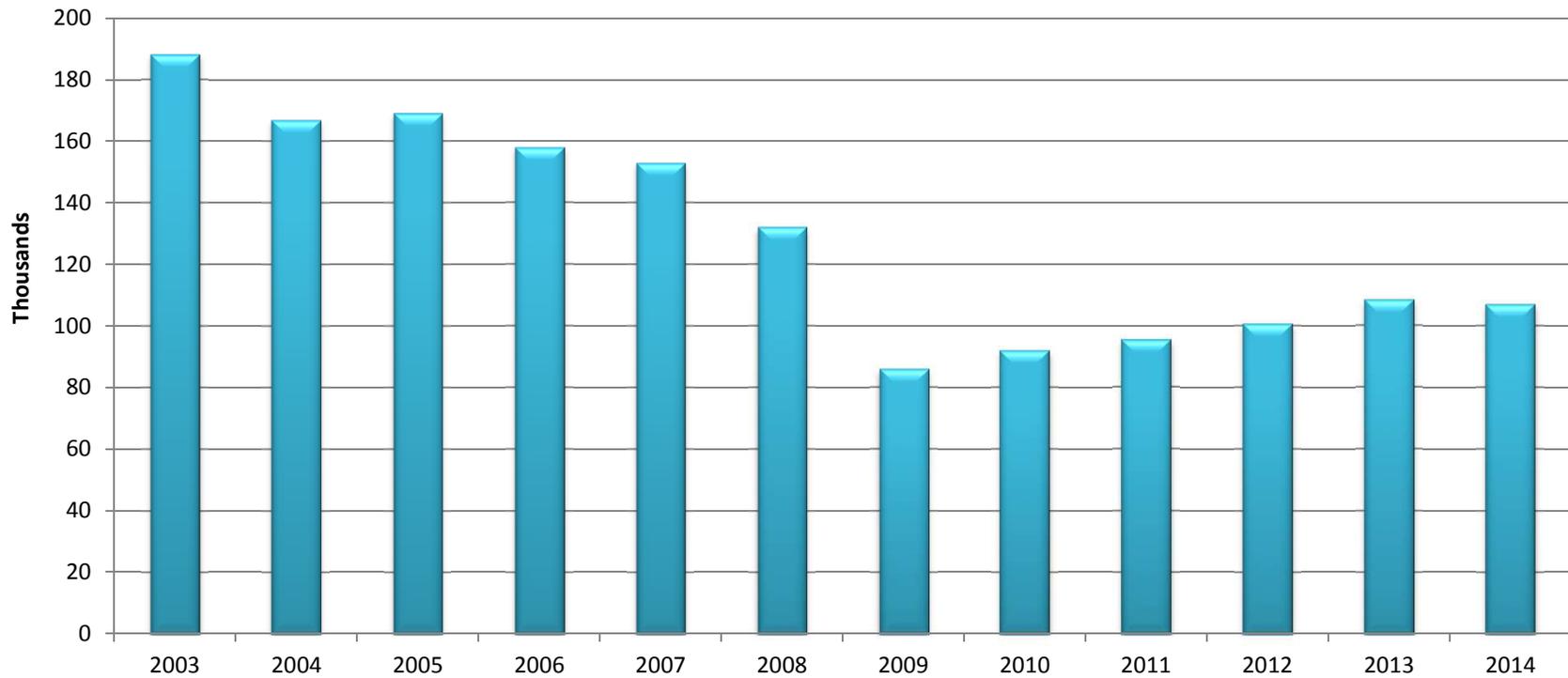
Missouri SO₂ Total Emissions (2011 NEI V2) Tons per Year



Source:
<http://www.epa.gov/air/emissions/>
Source Sector Category Details:
<http://www.epa.gov/air/emissions/basic.htm>

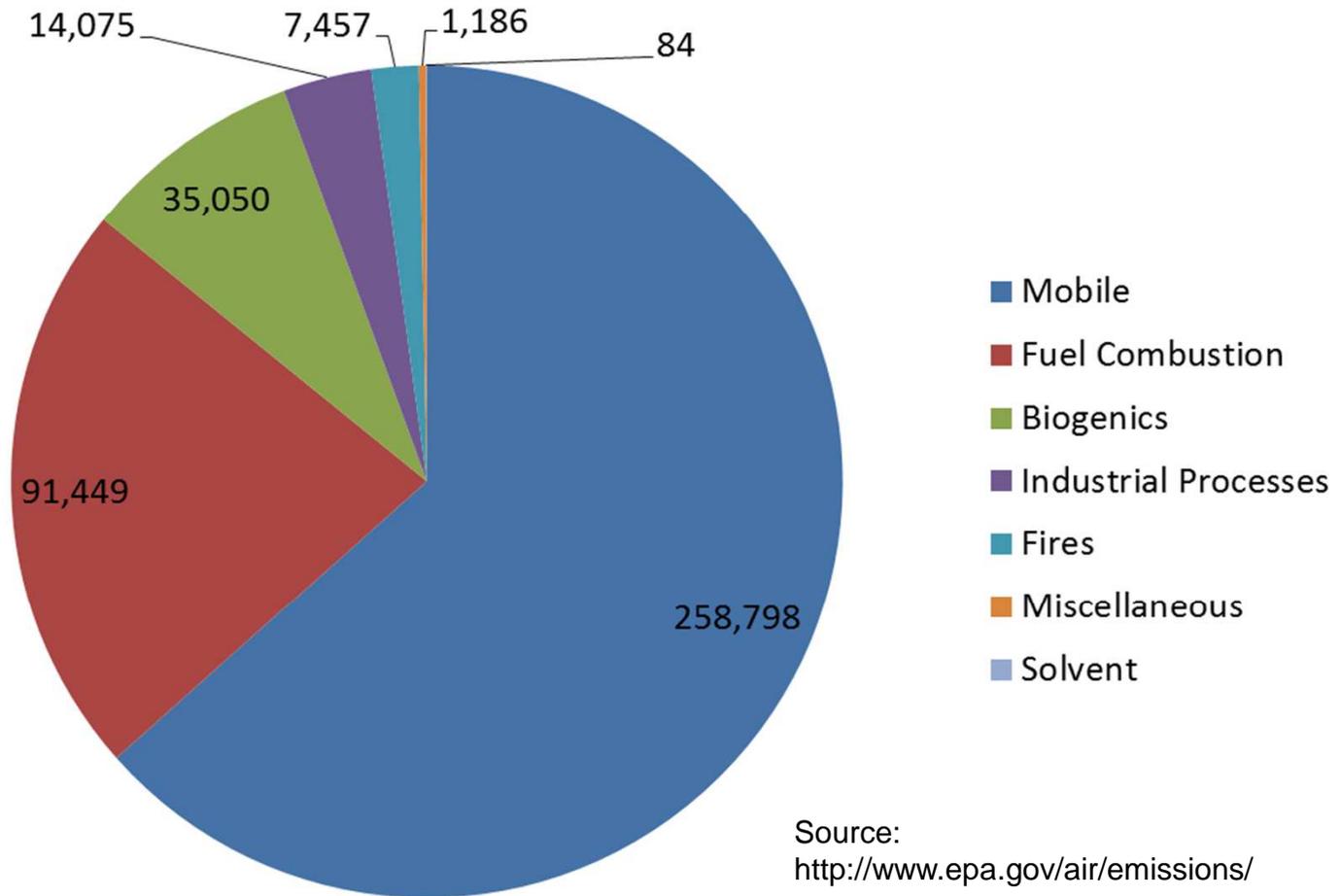
Nitrogen Dioxide (NO₂) Emissions

**Nitrogen Dioxide
Thousand Tons per Year**





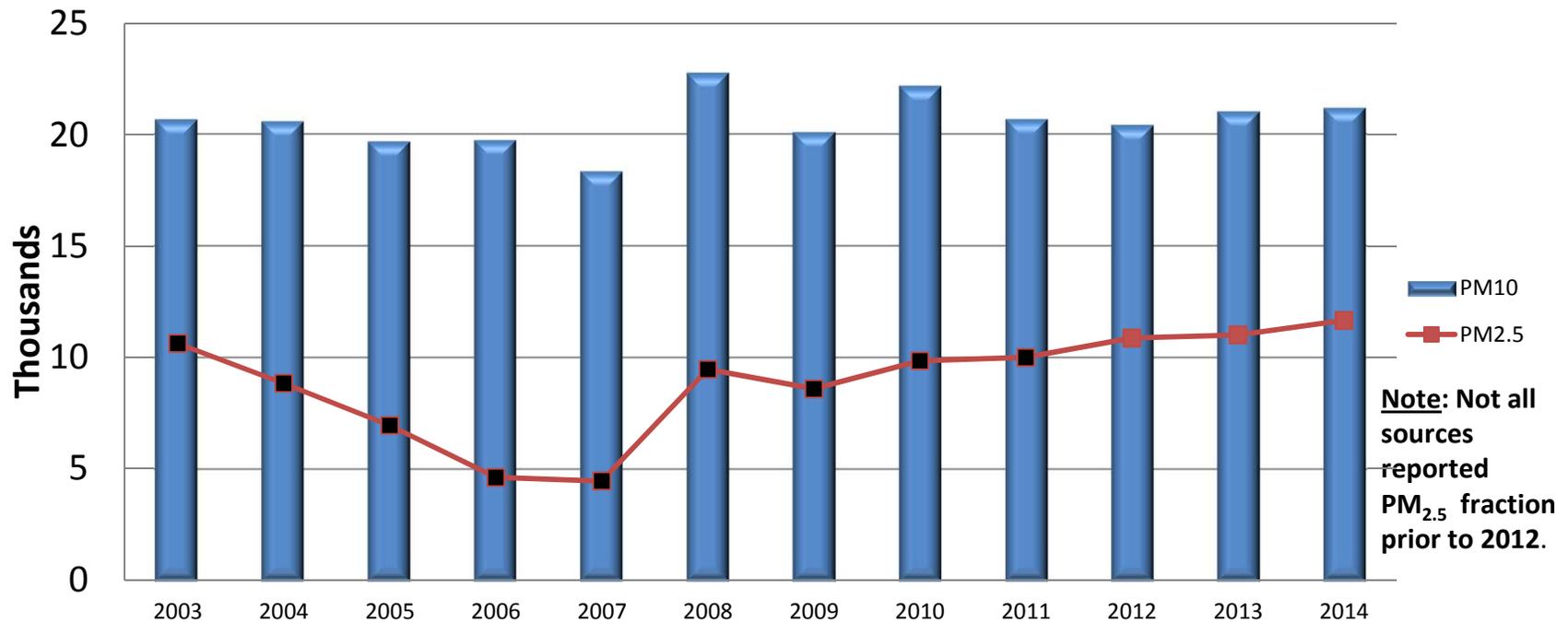
Total Missouri NOx Emissions (2011 NEI V2) Tons per Year



Source:
<http://www.epa.gov/air/emissions/>
Source Sector Category Details:
<http://www.epa.gov/air/emissions/basic.htm>

Particulate Matter (PM₁₀)

Particulate Matter (PM₁₀)
(With PM_{2.5} Fraction)
Thousand Tons per Year



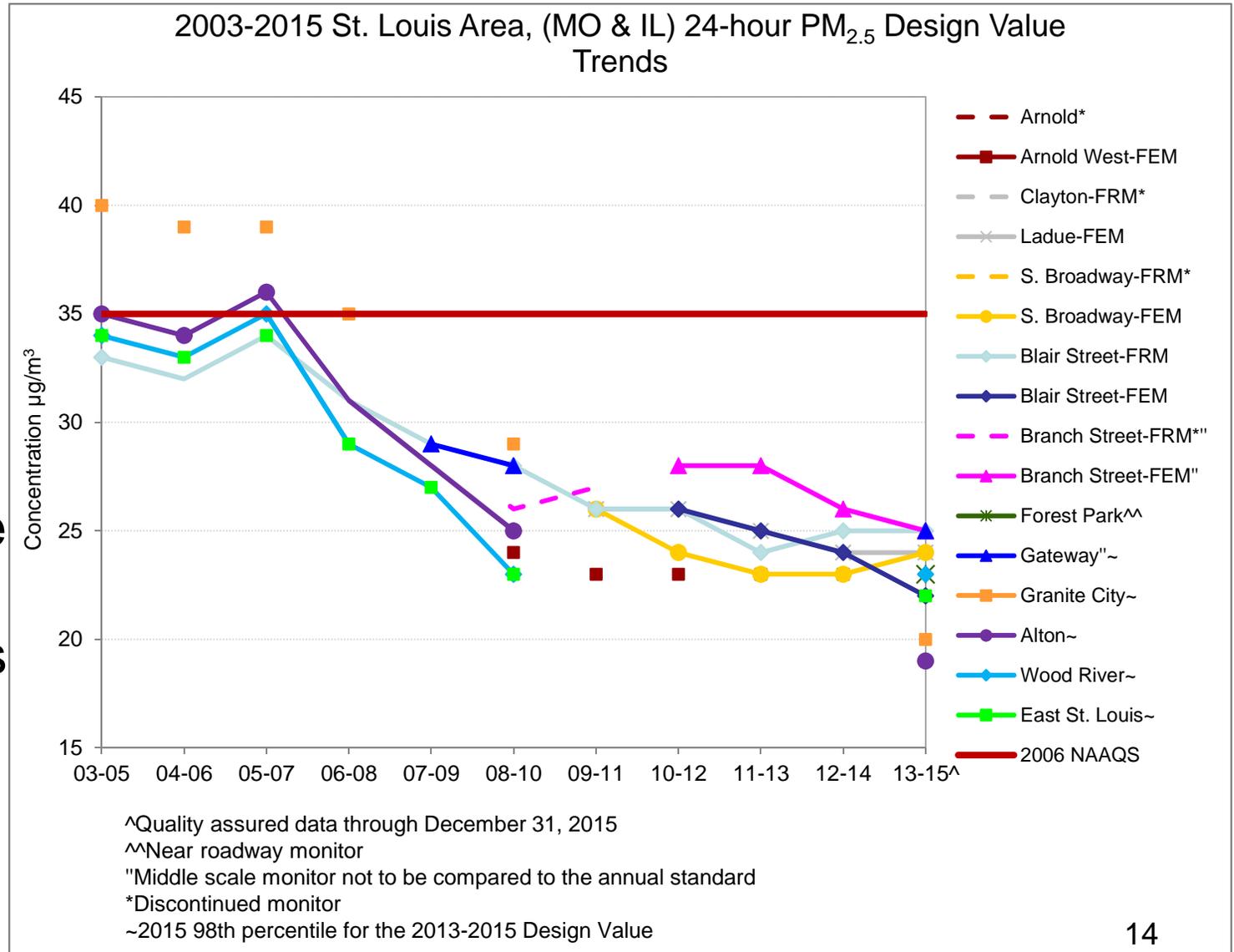
Ambient Air Monitoring Trends

- Particulate Matter- Area wide criteria pollutant monitoring long term trends are decreasing.
- Reduction in secondary formed $PM_{2.5}$ from precursor pollutants is likely part of reason.
- $PM_{2.5}$ Speciation monitoring helps tell the story.

PM_{2.5} 24-hour Average Ambient Air Monitoring Trends

➤ MO Sites in Compliance

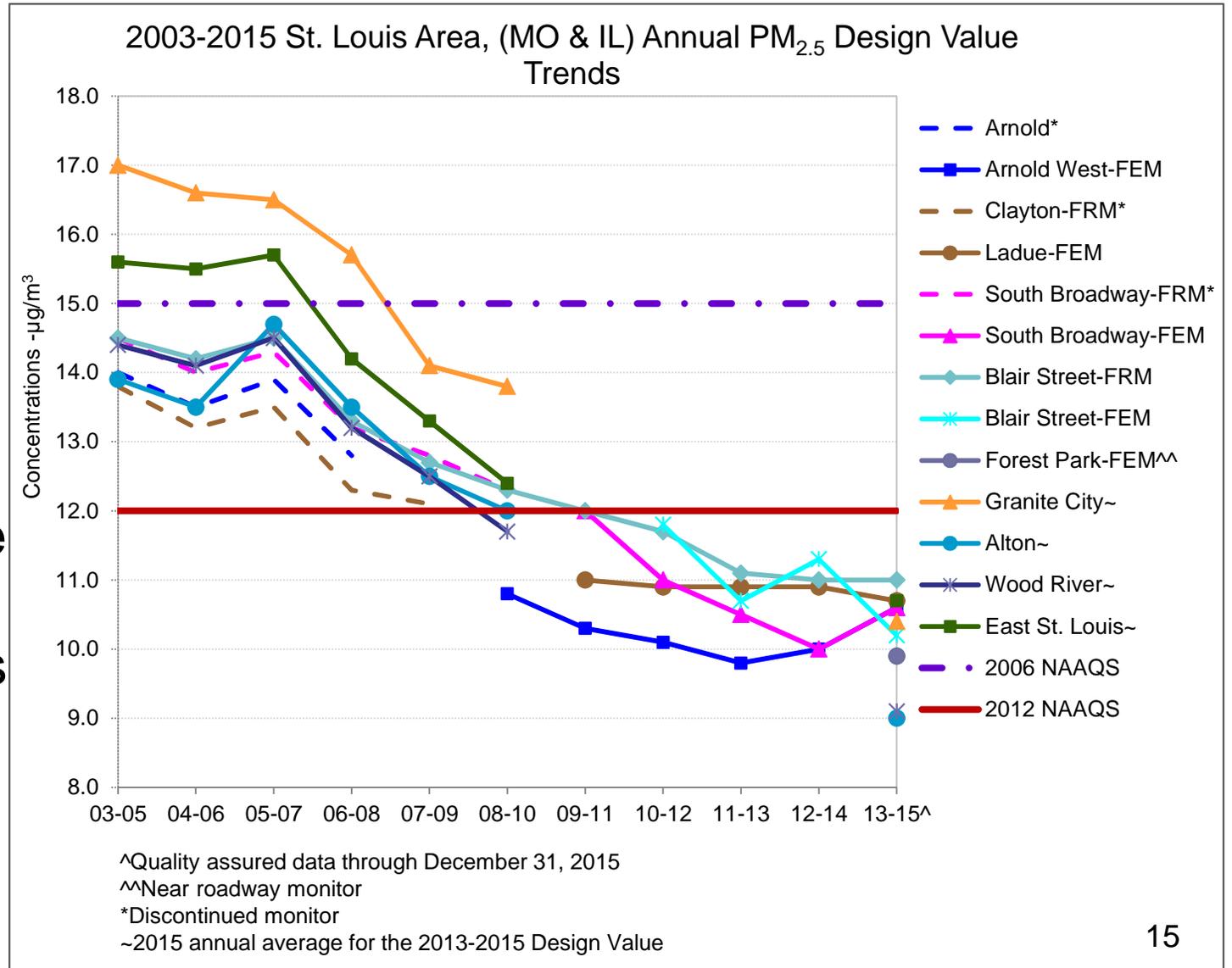
➤ Illinois Sites Monitoring for compliance (2015-2017)



PM_{2.5} Annual Average Ambient Air Monitoring Trends

➤ MO Sites in Compliance

➤ Illinois Sites Monitoring for compliance (2015-2017)



Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report and AMP450 Report

Ambient PM_{2.5} Particulate

- Directly emitted: From point, non-point, mobile sources.
- Secondary Particles: PM_{2.5} formed from precursor pollutants under various atmospheric conditions.

Secondary particle formation varies by season and region of the country. Very complex and difficult to quantify.

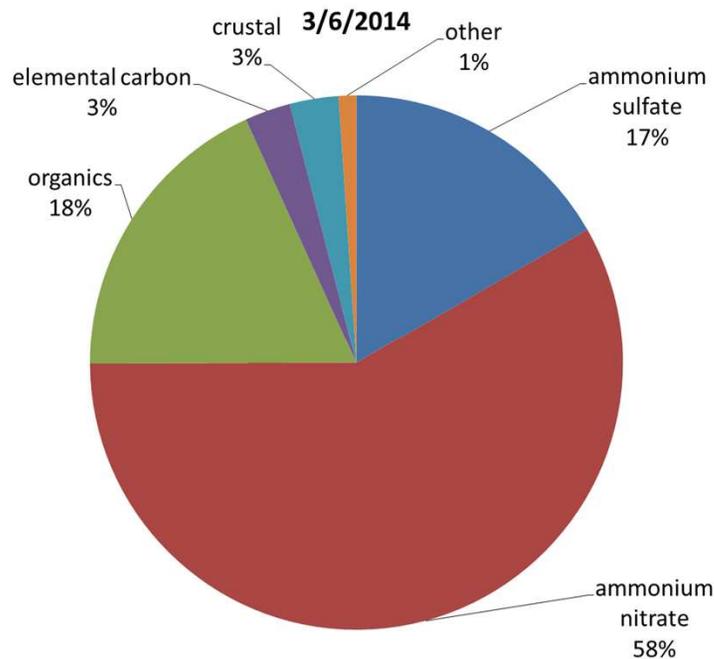
Common Secondary PM_{2.5}

- Ammonium Sulfate- SO₂ & ammonia emissions are precursors to (NH₄)₂SO₄
- Ammonium Nitrate- NO_x and ammonia emissions are precursors to (NH₄)(NO₃)
- Organic Aerosol- HVOCs (8>Carbon atoms) react with sunlight to form aerosol.

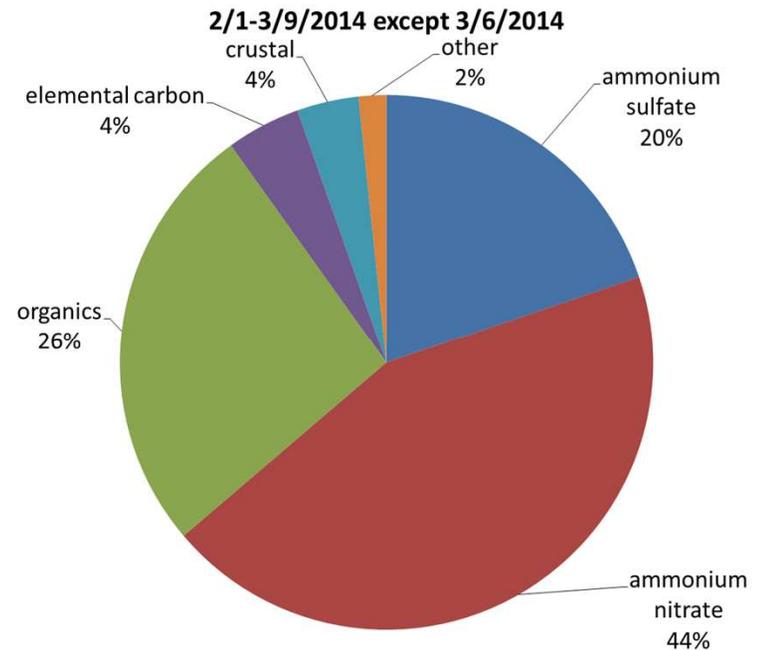
(from both anthropogenic and biogenic precursors)

Example: St. Louis area PM_{2.5}

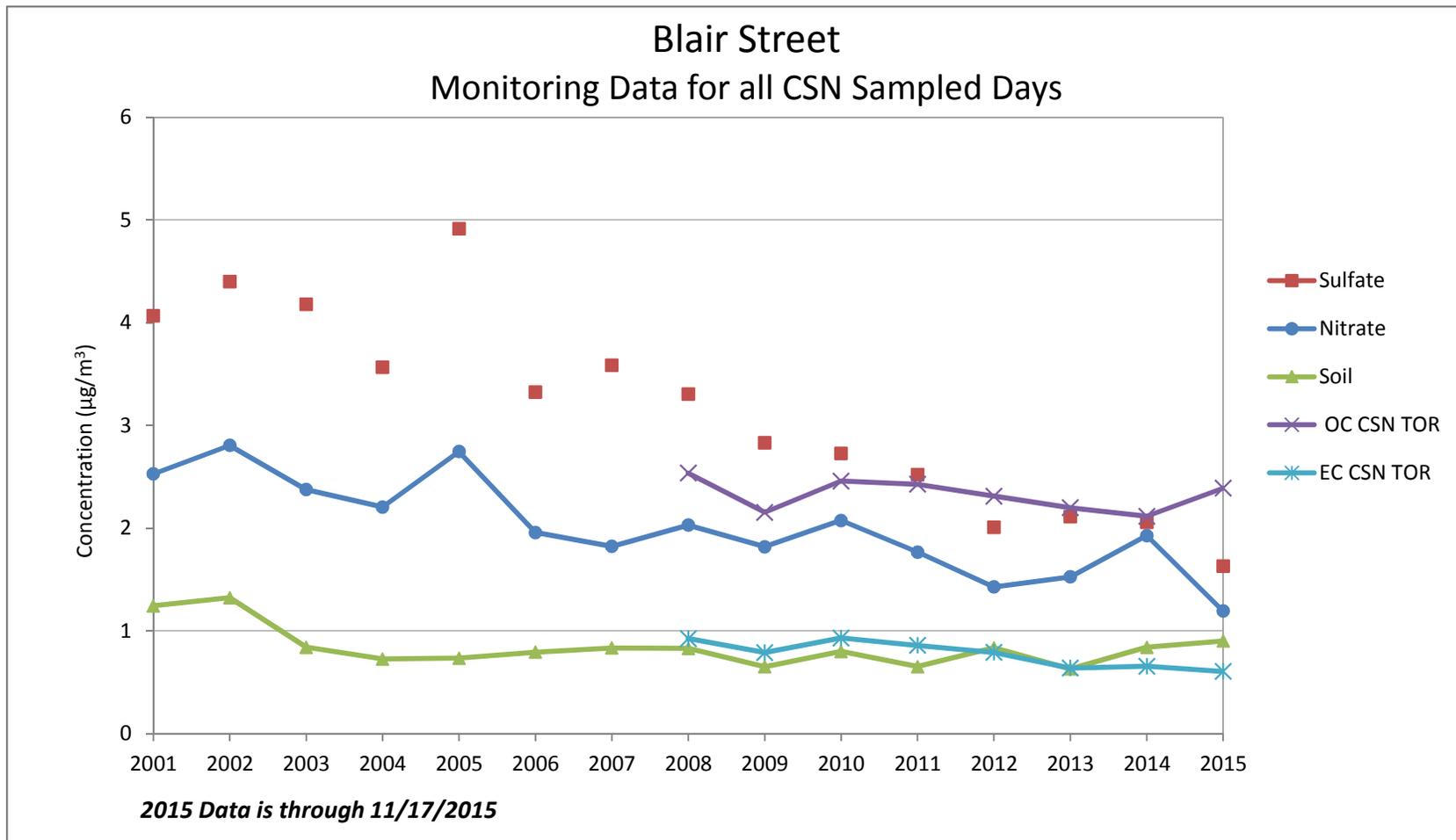
24-hour avg. > 35 $\mu\text{g}/\text{m}^3$



Average of several sampling days ~16 $\mu\text{g}/\text{m}^3$



St. Louis PM_{2.5} Speciation Trends

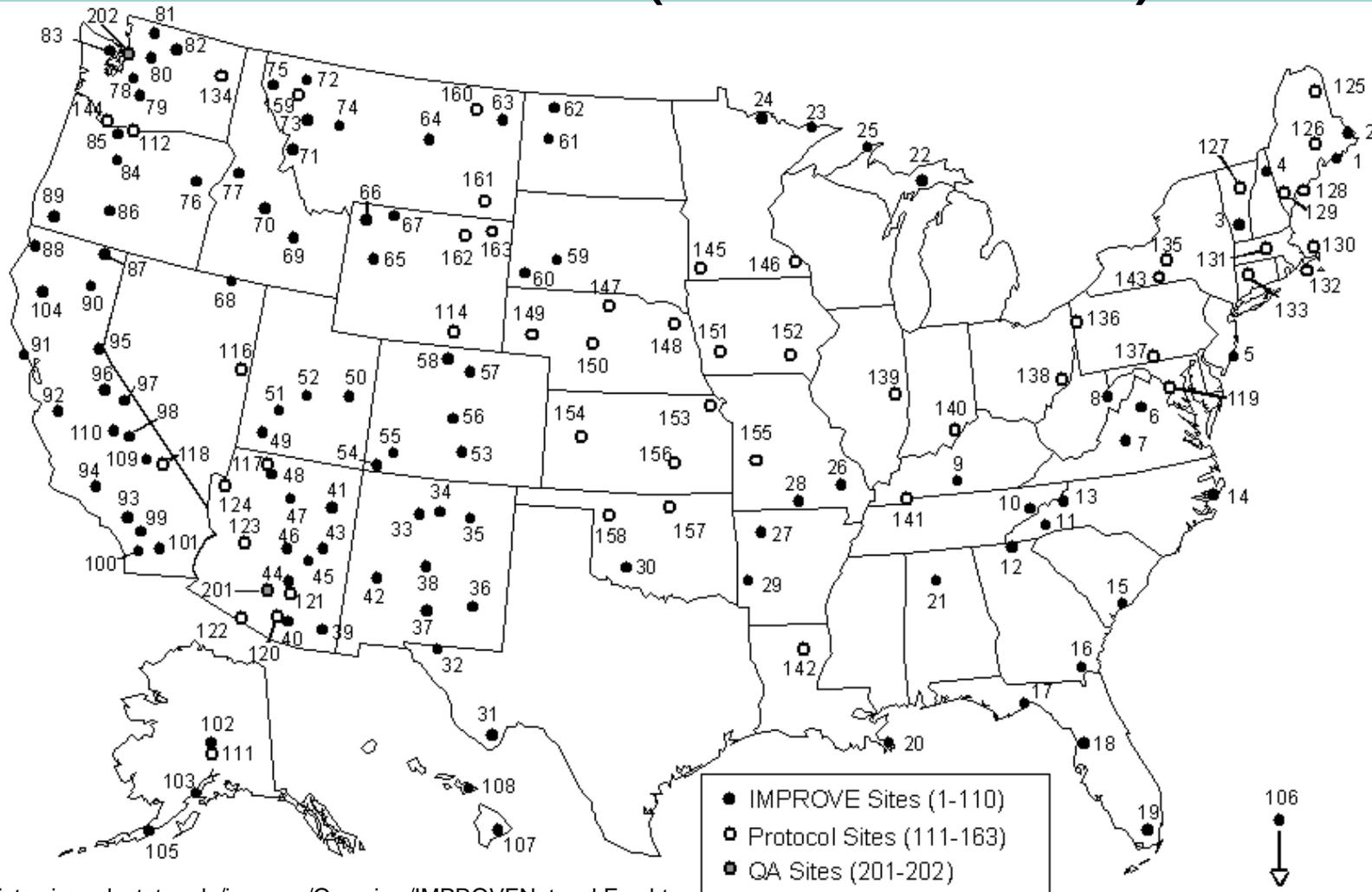


Regional PM_{2.5} Speciation Trends

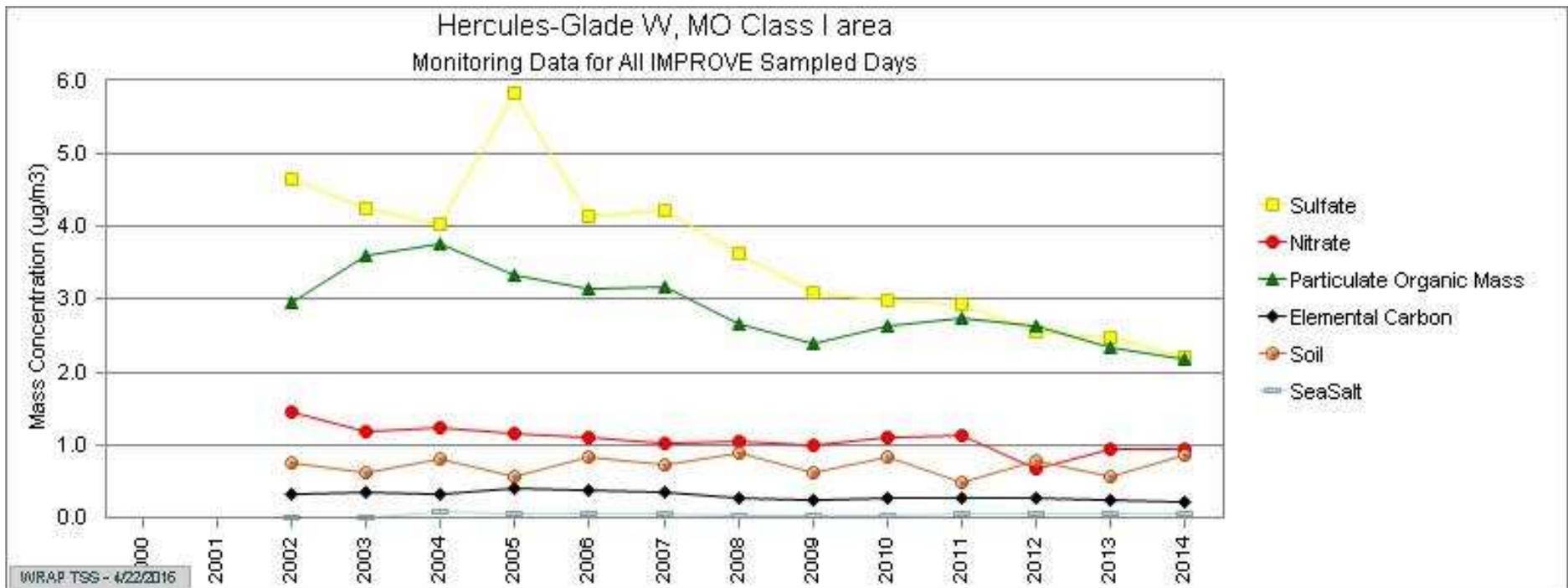
- Regional Haze Rule – Class I areas - Established for visibility impairment due to anthropogenic PM_{2.5} aerosol pollution.
- Interagency Monitoring of Protected Visual Environments (IMPROVE).
- Two Class I areas in MO- Mingo Wildlife Refuge and Hercules Glade.
- Many years of PM_{2.5} speciation data.



IMPROVE sites (circa 2002)

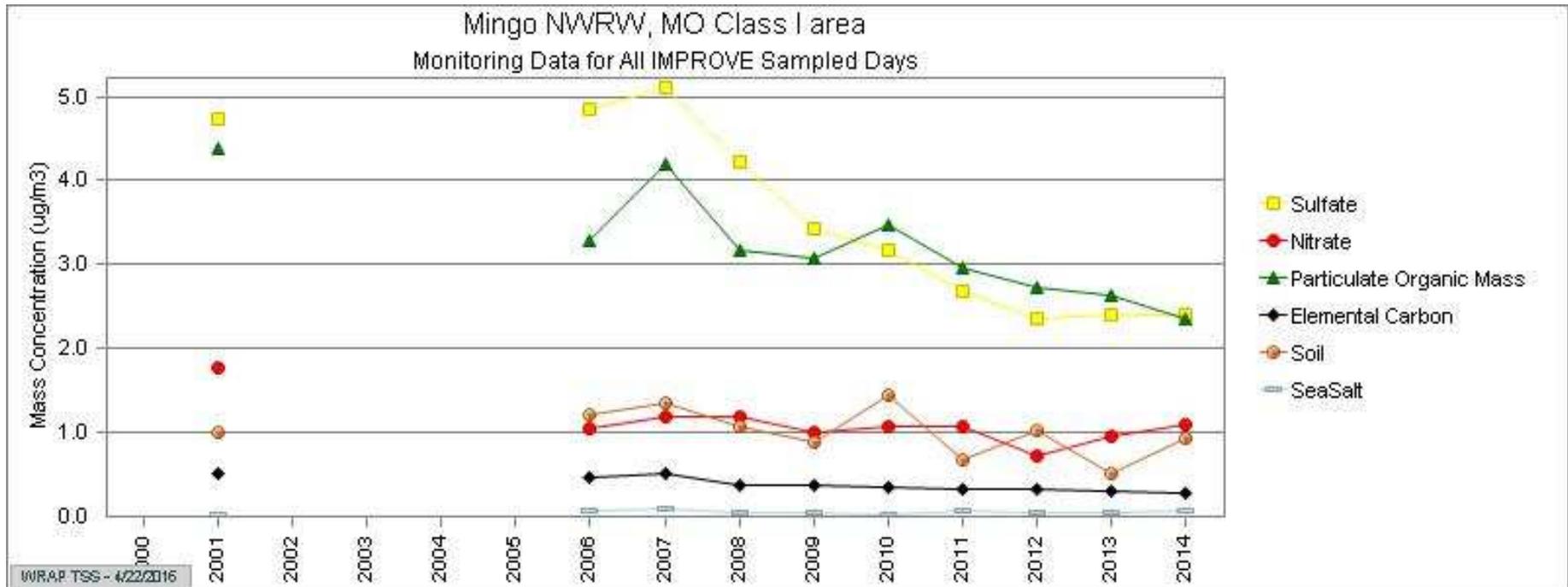


Hercules Glade- IMPROVE site (Class I area)



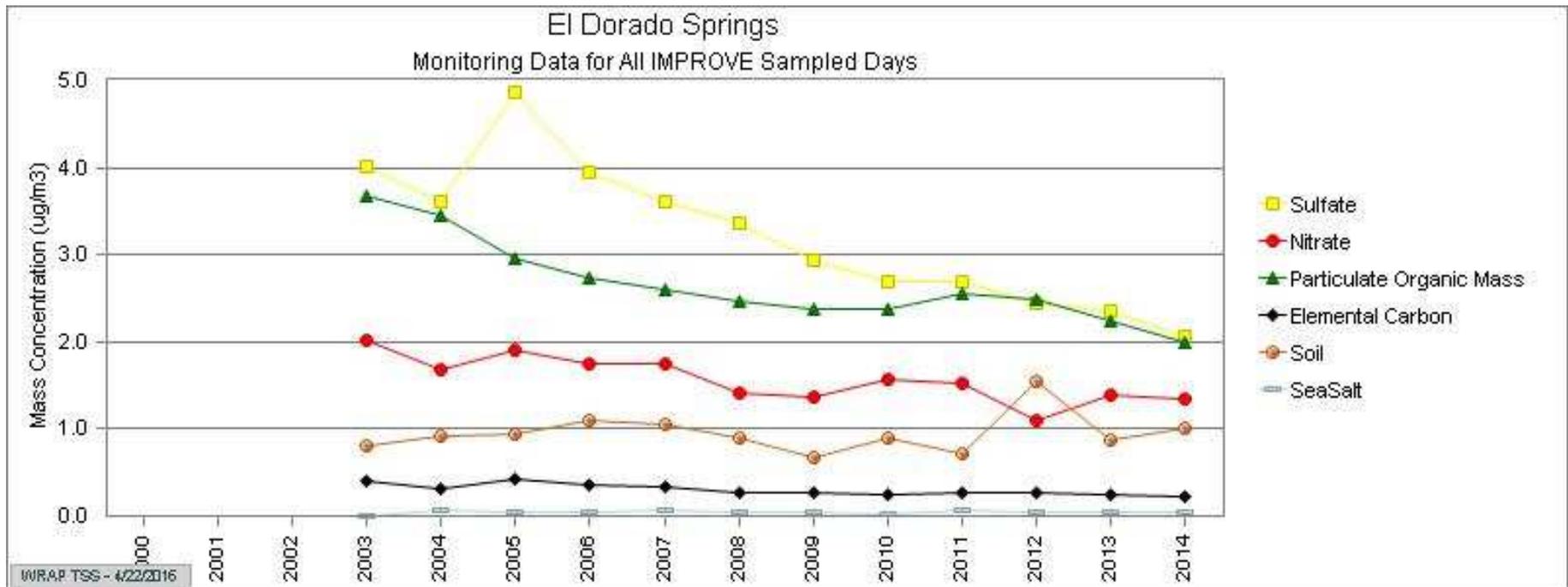
Source:
<http://vista.cira.colostate.edu/tss/Results/HazePlanning.aspx>

Mingo- IMPROVE site (Class I area)



Source:
<http://vista.cira.colostate.edu/tss/Results/HazePlanning.aspx>

El Dorado Springs State IMPROVE Protocol site. (Recently Discontinued)



Source:
<http://vista.cira.colostate.edu/tss/Results/HazePlanning.aspx>

Website Resources



Air Pollution Control Program

Home » Department of Environmental Quality

Our mission is to maintain the purity of Missouri's air to protect the health, general welfare and property of the people. The Air Pollution Control Program has more than 6 million customers. Whether an urban citizen or someone far removed from other people, everyone who lives in Missouri needs and deserves clean air. This home page will help you to find out more about the services available to help us protect air quality.

As part of the Division of Environmental Quality, the Air Pollution Control Program works diligently to improve air quality in Missouri. About **air quality** and **air pollutants**. **Missouri Skies Now and Then** offers a glimpse into some of the improvements we have made towards better air in Missouri.

EPA regulatory actions related to ground-level ozone

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\$50.01 - \$75
\$75.01 - \$100

Monitoring Information- 'Bookmark'

- Design Value Reports
- Preliminary hourly data reports
- Monitoring Network Plans and more
- More improvements coming...

- Program Home Page
- Air Conservation Commission
- Air Pollutants**
- Air Program Advisory Forum
- Air Quality
- Asbestos
- Clean Power Plan
- Forms and Applications
- Gateway Vehicle Inspection Program
- Laws and Regulations
- NAAQS Boundary Designations
- Ozone
- Permits
- Publications and Reports
- Public Notices-Comment Periods
- QAPP Template**
- Air Pollution Compliance/Regulatory Assistance
- State Plans
- Vapor Recovery Information and Compliance Requirements

Division of Environmental Quality Director: Leanne Tippett Mosby

Date: May 17, 2016

Nothing in this document may be used to implement any enforcement action or levy any penalty unless promulgated by rule under chapter 536 or authorized by statute.