Proposed Air Pollution Transport Rule

- Reducing Air Pollution
- Protecting Public Health

U.S. Environmental Protection Agency
Office of Air and Radiation
July 26, 2010

Key Points

- EPA is taking another step to protect public health, help states reduce air pollution, and attain clean air standards. This proposal would reduce pollution quickly:
  - preserving initial Clean Air Interstate Rule (CAIR) controls.
  - requiring further pollution reductions.

- EPA is issuing this proposal now because millions of people continue to breathe unhealthy air that does not meet our national air quality standards.

- EPA is putting in place a new approach that helps states meet their obligations to reduce transported pollution and attain and maintain compliance with the national ambient air quality standards.

- More emissions reductions are needed to protect public health and the environment from air pollution, and work is ongoing to implement Clean Air Act protections.
  - For example, we've begun assessing the transport of air pollution across state boundaries that could affect meeting the upcoming 2010 ozone standard.

Overview

I. Summary of purpose and goals of this proposal

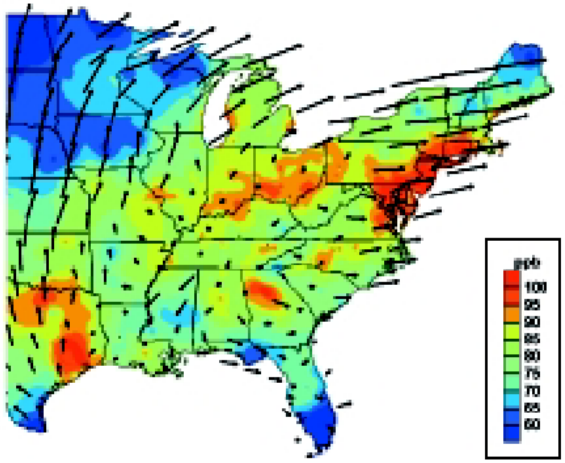
II. Benefits and costs of proposed Transport Rule

III. How proposed rule works and addresses the 2008 court action remanding CAIR

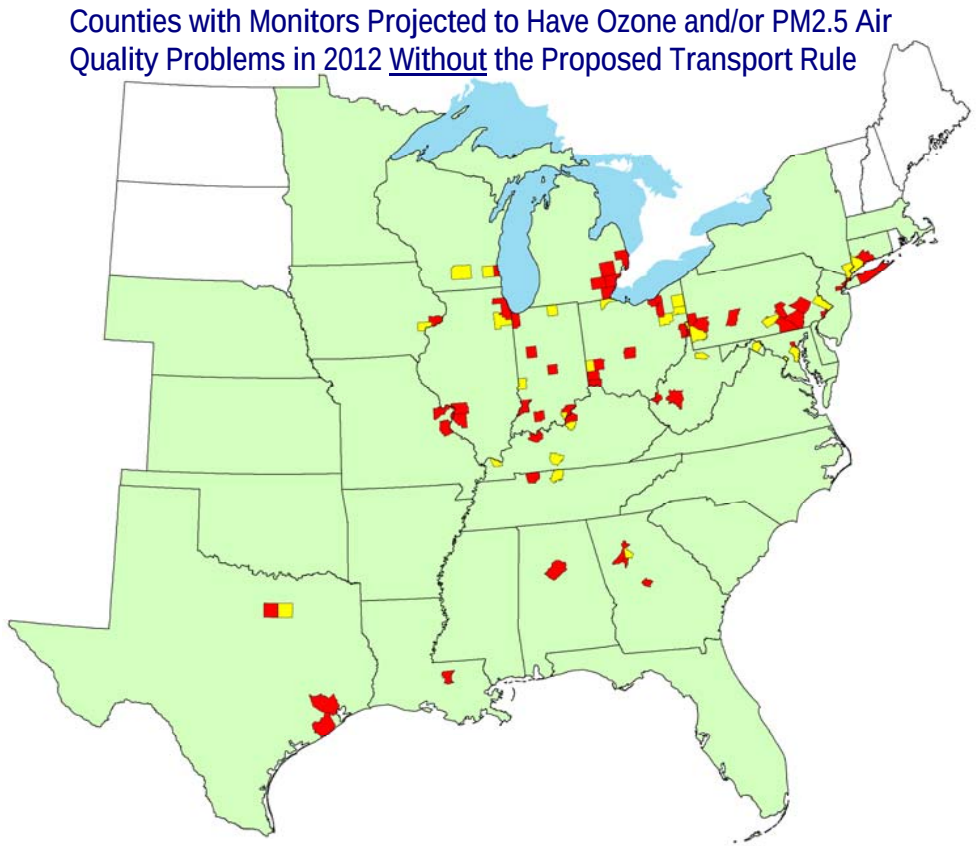
Transport of Air Pollution

- Air pollution can travel hundreds of miles and cause multiple health and environmental problems on regional or national scales.
- This proposal reduces emissions contributing to fine particle ($PM_{2.5}$) and ozone nonattainment that often travel across state lines:
  - Sulfur dioxide (SO_2) and nitrogen oxides (NO_x) contribute to $PM_{2.5}$ transport
  - NO_x contributes to ozone transport
- Many areas are still violating the 1997 ozone and the 1997 and 2006 fine particulate health-based air quality standards.
- Attaining national ambient air quality standards will require some combination of emission reductions from:
  - Sources located further from the nonattainment area, and
  - Sources located in or near nonattainment areas.
  - Pollution is emitted by power plants, cars, trucks, and other industrial facilities.

Transport Winds and Ozone Patterns on High Ozone Days



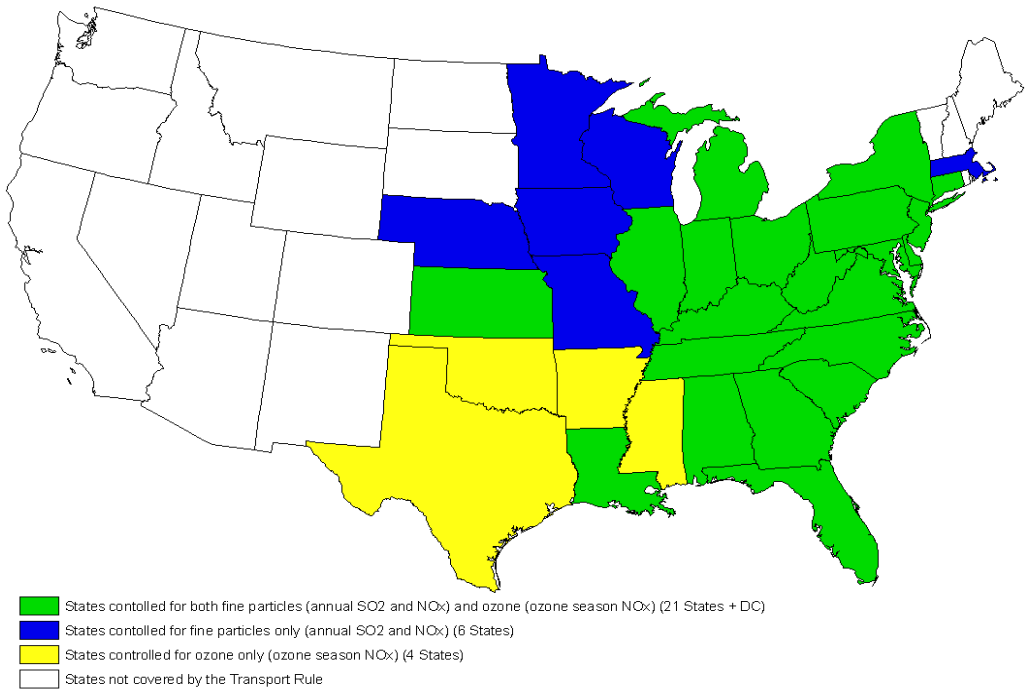
Why Is EPA Doing this Rule?



- **In 2012, EPA projects that:**
  - Some communities will still not meet the air quality standards.
  - Many upwind states will still contribute significantly to downwind nonattainment areas.
- **This proposal affects power plants because their emission reductions are most cost-effective.**
- **Other actions by EPA and the states must be taken before all areas will attain the current and future National Ambient Air Quality Standards (NAAQS).**

This analysis assumes that the Clean Air Interstate Rule is not in effect. It does reflect other federal and state requirements to reduce emissions contributing to ozone and fine particle pollution that were in place as of February 2009.

Proposal Would Reduce Emissions in 31 States + DC



- Proposal includes separate requirements for:
  - Annual SO_2 reductions
  - NO_x reductions (2012)
  - Ozone-season NO_x reductions (2012)
- Sets emissions budgets for each state

NO_X and SO_2 Emissions Affect the Health of Millions of Americans and Our Environment

- NO_X contributes to the formation of $PM_{2.5}$ and ground-level ozone.
- SO_2 contributes to the formation of $PM_{2.5}$.
- $PM_{2.5}$ has been linked to premature death, serious illnesses such as chronic bronchitis and heart attacks, and respiratory problems.
- Ozone has been linked to premature mortality, lung damage, respiratory symptoms, aggravation of asthma and other respiratory conditions.
- Sulfur deposition acidifies surface waters, and damages forest ecosystems and soils.
- Nitrogen deposition acidifies surface waters, damages forest ecosystems and soils, and contributes to coastal eutrophication.
- SO_2 and NO_X impair visibility, including at national parks and wilderness areas.

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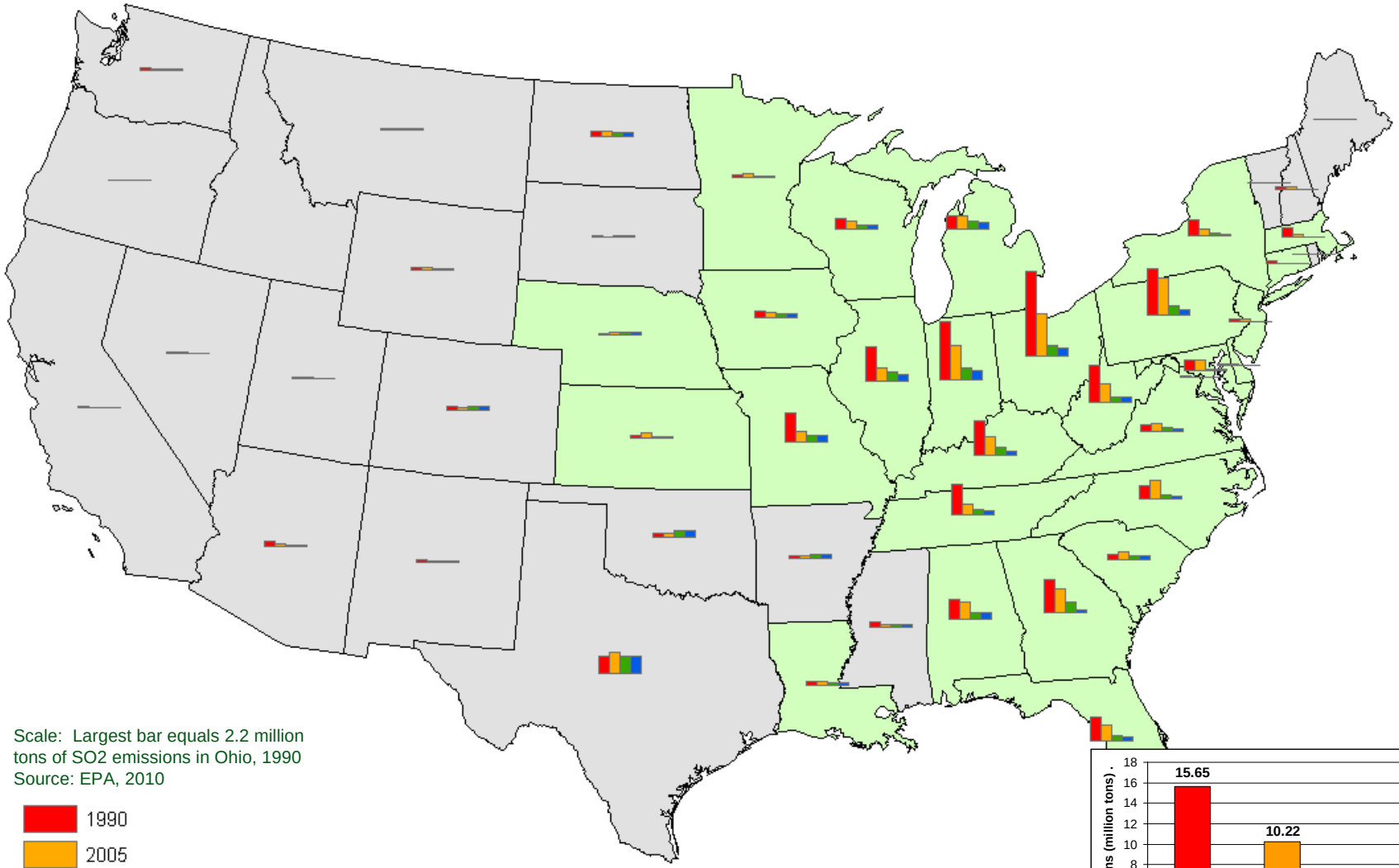
Health and Environmental Benefits

Significant NO_X and SO_2 Reductions from Transport Rule Proposal

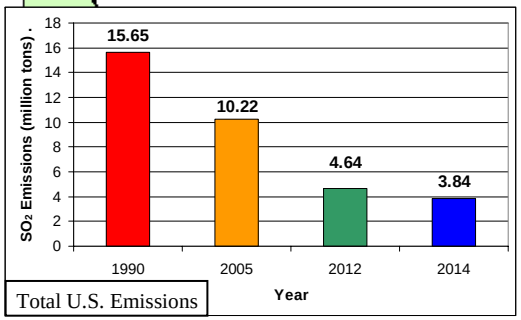
- By 2014, EPA modeling projects that implementation of the Transport Rule, as proposed, combined with other state and EPA actions, would reduce 2005 emissions from electric generating units in the covered states by:
  - 6.3 million tons of SO_2 per year
  - 1.4 million tons of NO_X per year
    - 300,000 tons of NO_X during ozone season (included in NO_X estimate above)
- These reductions represent a 71% reduction in SO_2 and a 52% reduction in NO_X emissions from power plants from 2005 levels in the covered states.
- In the states and DC covered by the proposed Transport Rule, in 2014, SO_2 emissions would be capped at 2.5 million tons per year annually and NO_X emissions would be capped at 1.4 million tons per year (ozone season NO_X emissions will be capped at 600,000 tons per year).

Annual SO_2 Power Plant Emissions 1990-2014 *



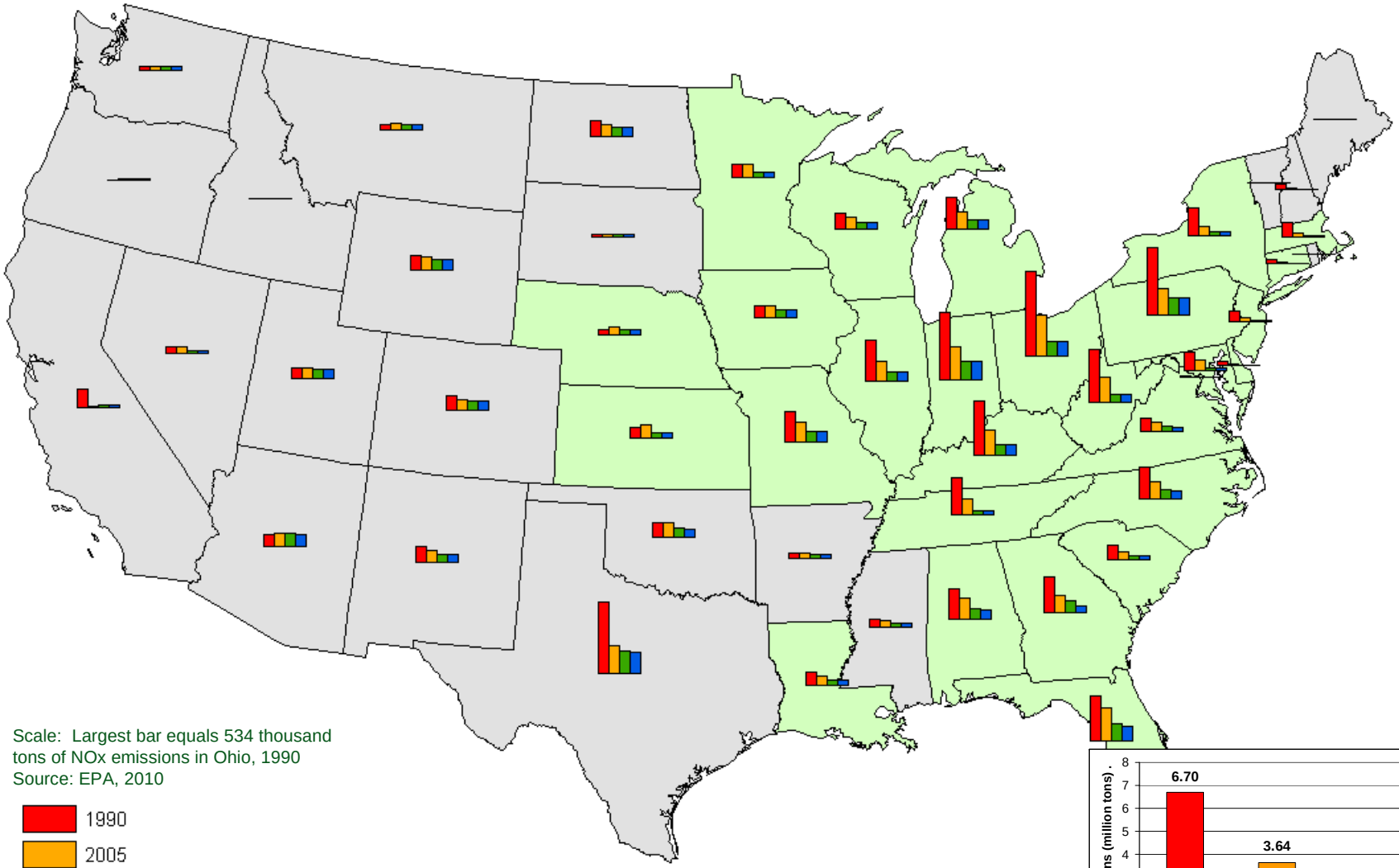
Scale: Largest bar equals 2.2 million tons of SO2 emissions in Ohio, 1990
Source: EPA, 2010

1990
2005
2012 Proposed Remedy
2014 Proposed Remedy
States controlled for fine particles (annual SO2 and NOx) (27 States + DC)
States not covered for fine particles



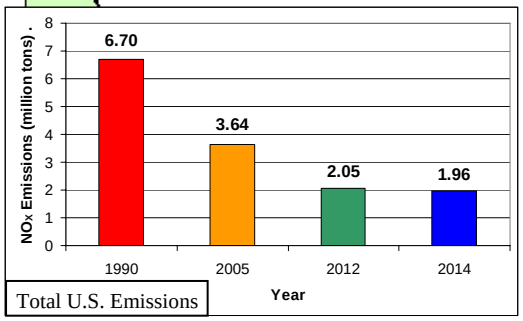
* Emissions shown include only Acid Rain Program sources -- for 97% of annual Transport Rule SO_2 emissions and 88% of Transport Rule units in 2014.

Annual NO_X Power Plant Emissions 1990-2014 *



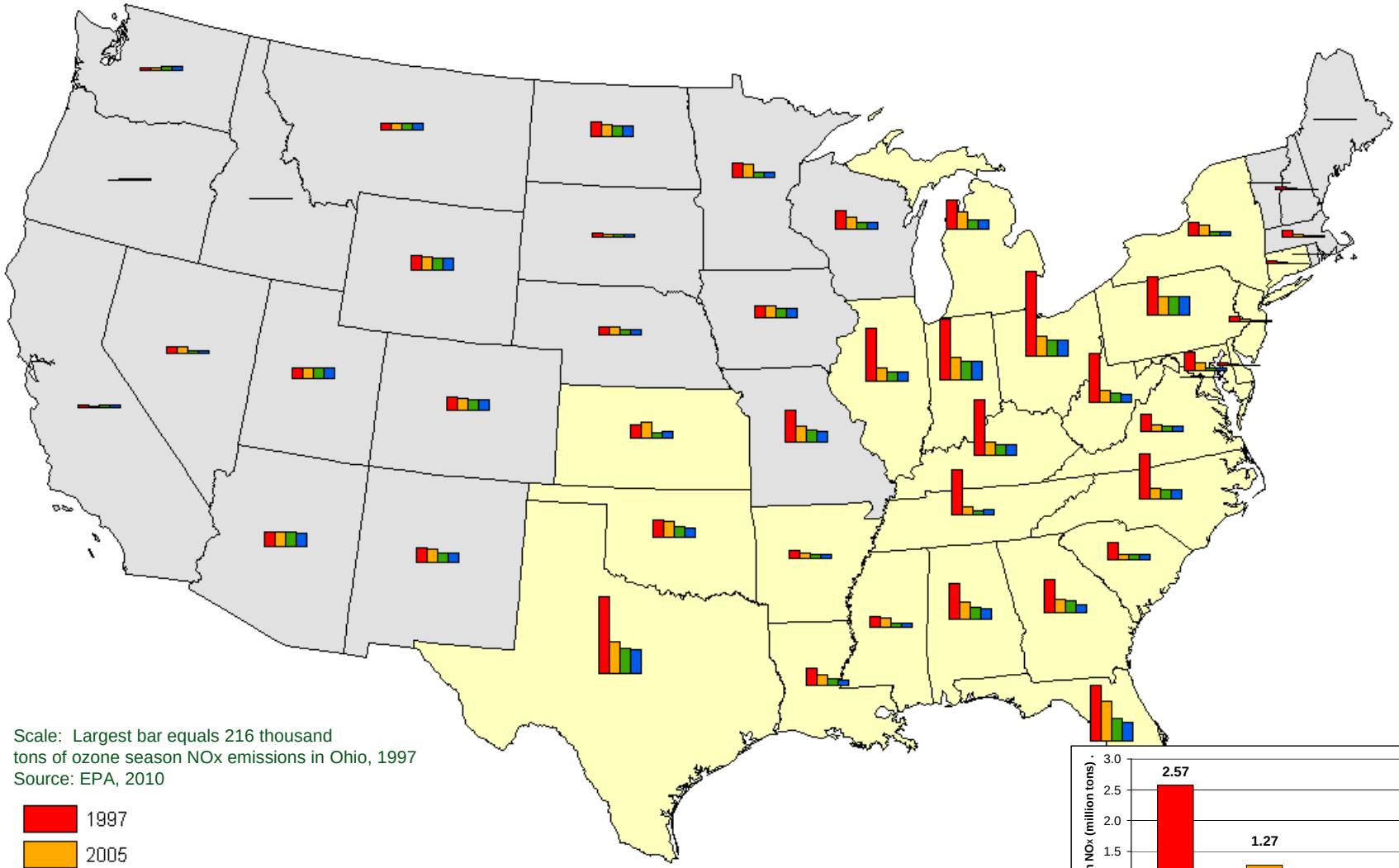
Scale: Largest bar equals 534 thousand tons of NOx emissions in Ohio, 1990
Source: EPA, 2010

1990
2005
2012 Proposed Remedy
2014 Proposed Remedy
States controlled for fine particles (annual SO2 and NOx) (27 States + DC)
States not covered for fine particles



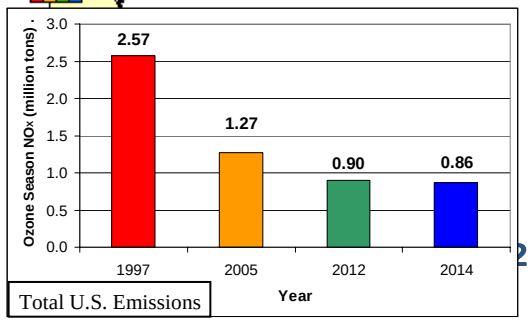
* Emissions shown include only Acid Rain Program sources – for 96% of annual Transport Rule NO_X emissions and 88% of Transport Rule units in 2014.

Ozone Season NO_X Power Plant Emissions 1997-2014 *



Scale: Largest bar equals 216 thousand tons of ozone season NOx emissions in Ohio, 1997
Source: EPA, 2010

1997
2005
2012 Proposed Remedy
2014 Proposed Remedy
States controlled for ozone (ozone season NOx) (25 States + DC)
States not covered by the Transport Rule



* Emissions shown include only Acid Rain Program sources – for 96% of ozone season Transport Rule NO_X emissions and 88% of Transport Rule units in 2014.

Benefits Outweigh Costs

- EPA estimates the annual benefits from the proposed rule range between $120-$290 billion (2006 $) in 2014.
  - Most of these benefits are public health-related.
  - $3.6 billion are attributable to visibility improvements in areas such as national parks and wilderness areas.
  - Other nonmonetized benefits include reductions in mercury contamination, acid rain, eutrophication of estuaries and coastal waters, and acidification of forest soils.
- EPA estimates annual compliance costs at $2.8 billion in 2014.
- Modest costs mean small effects on electricity generation. EPA estimates that in 2014:
  - Electricity prices increase less than 2 percent.
  - Natural gas prices increase less than 1 percent.
  - Coal use is reduced by less than 1 percent.

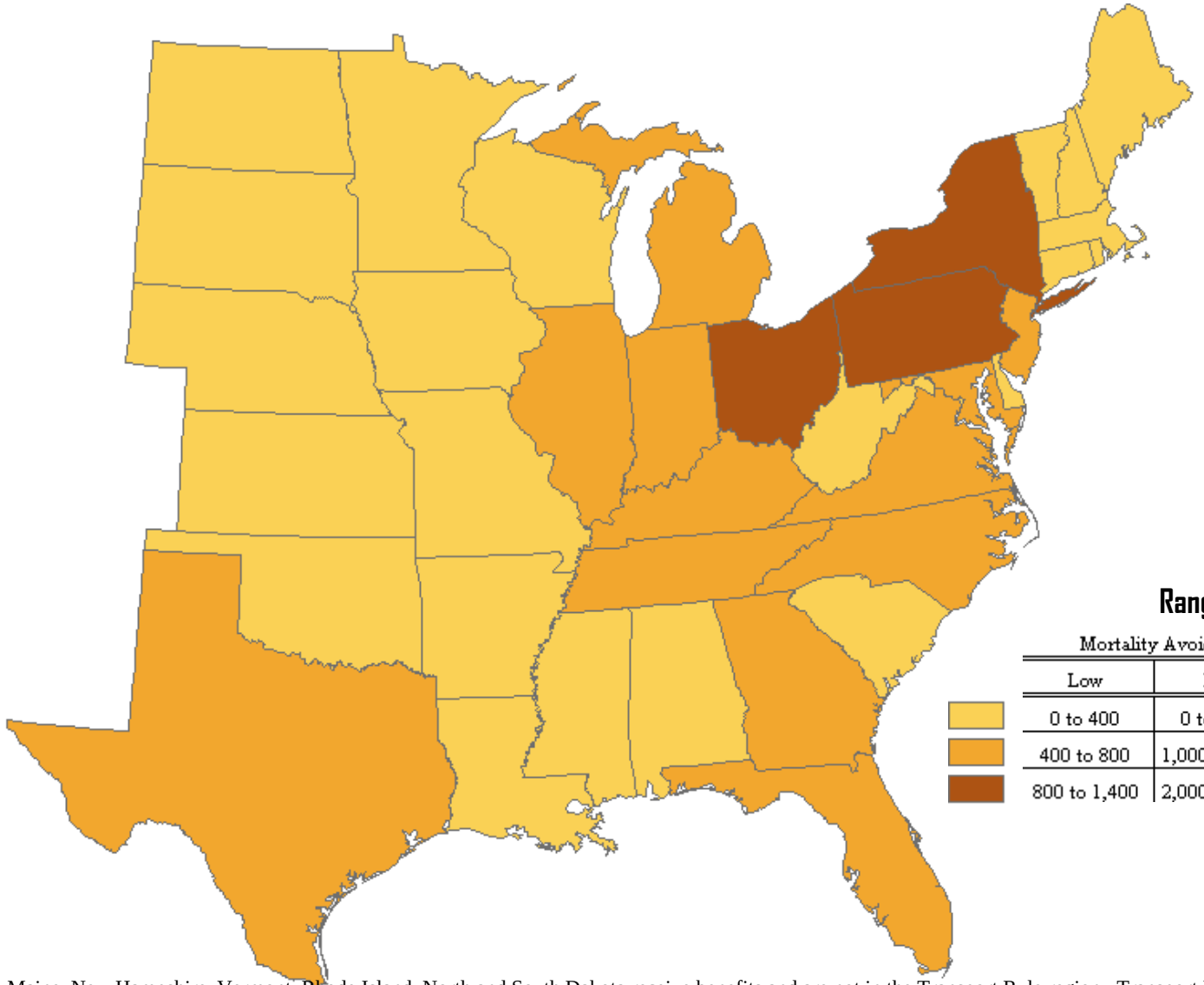
Health Benefits for Millions of Americans

Estimated Number of Adverse Health Effects Avoided Due to Implementing the Proposed Transport Rule*

Health Effect	Number of Cases Avoided
Premature mortality	**14,000 to 36,000**
Non-fatal heart attacks	**23,000**
Hospital and emergency department visits	**26,000**
Acute bronchitis	**21,000**
Upper and lower respiratory symptoms	**440,000**
Aggravated asthma	**240,000**
Days when people miss work or school	**1.9 million**
Days when people must restrict their activities	**11 million**

* Impacts avoided due to improvements in $PM_{2.5}$ and ozone air quality in 2014

Billions of Dollars of Health Benefits in 2014

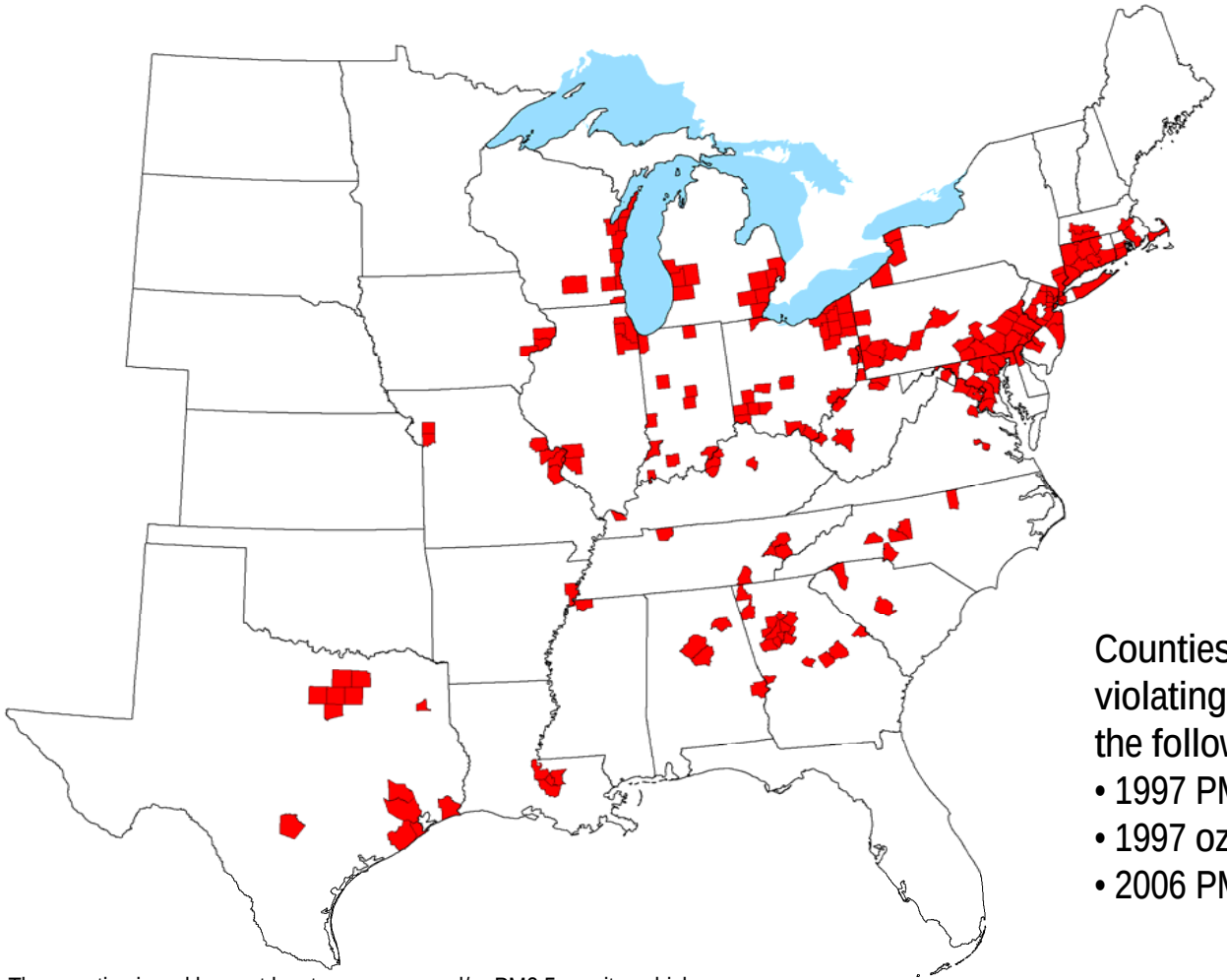


Ranges of Benefits

Mortality Avoided		Monetized Benefits (billion $)	
Low	High	Low	High
0 to 400	0 to 1,000	0 to 4	0 to 10
400 to 800	1,000 to 2,000	4 to 7	10 to 15
800 to 1,400	2,000 to 3,600	7 to 12	15 to 29

Maine, New Hampshire, Vermont, Rhode Island, North and South Dakota receive benefits and are not in the Transport Rule region. Transport Rule RIA, Table A-4 and A-5; mortality impacts estimated using Laden et al. (2006), Levy et al. (2005), Pope et al. (2002) and Bell et al. (2004); monetized benefits discounted at 3%

Counties Violating Air Quality Standards in the Proposed Transport Rule Region
(based on 2003-07 air quality monitoring data)



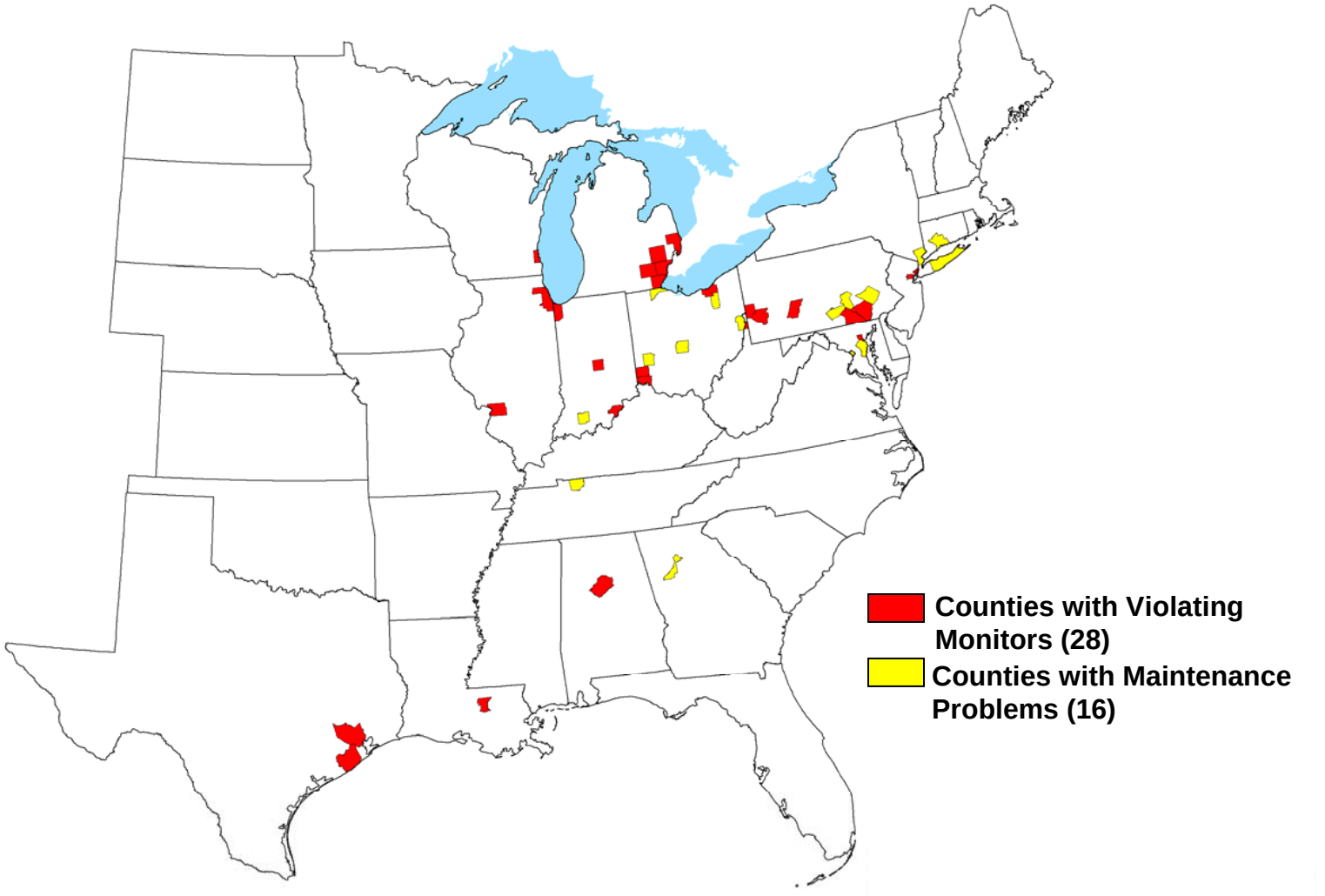
Counties in red are violating one or more of the following NAAQS:

- 1997 $PM_{2.5}$
- 1997 ozone
- 2006 $PM_{2.5}$

The counties in red have at least one ozone and/or PM2.5 monitor which violated the NAAQS in the periods 2003-2005, 2004-2006, and/or 2005-2007.

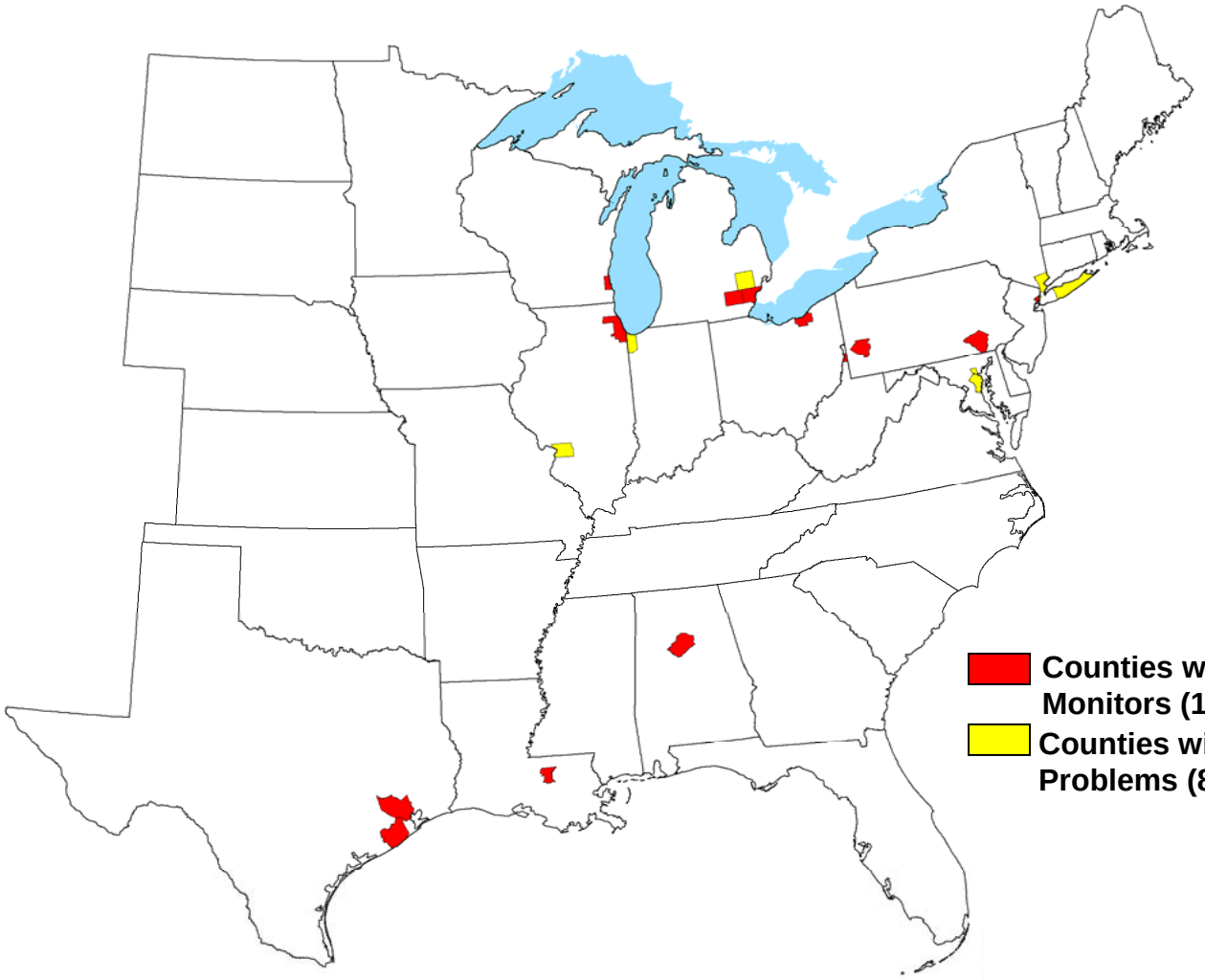
Counties with Violating Monitors (207)

Counties with Monitors Projected to Have Ozone and/or PM2.5 Air Quality Problems in 2014 Without the Proposed Transport Rule



This analysis assumes that the Clean Air Interstate Rule is not in effect. It does reflect other federal and state requirements to reduce emissions contributing to ozone and fine particle pollution that were in place as of February 2009.

Counties with Monitors Projected to Have Ozone and/or PM2.5 Air Quality Problems in 2014 With the Proposed Transport Rule



This analysis assumes that the Clean Air Interstate Rule is not in effect. It does reflect other federal and state requirements to reduce emissions contributing to ozone and fine particle pollution that were in place as of February 2009.

Ozone: More Needs to Be Done

- EPA is moving quickly on this rule to ensure the earliest public health protection and respond to the court as soon as possible.
- This proposal would achieve reductions in seasonal ozone levels.
- Additional emissions reductions will be needed for the nation to attain the existing ozone standard and any upcoming 2010 ozone standards.
- EPA has already started the required analyses to determine the responsibility of upwind states for ozone problems projected to remain after today's rule. We anticipate proposing a determination to address pollution transport for any upcoming ozone standard in 2011 and finalizing it in 2012.
- EPA plans to identify any needed emissions reductions from upwind states in time to help downwind states attain the reconsidered ozone standards.

EPA's Ongoing Commitment to Assist States

- With today's action, EPA is making an ongoing commitment to help states implement the "good neighbor" provision of the Clean Air Act, which prohibits each state from significantly contributing to air quality problems in another state.

- This rule proposes a procedure for determining each upwind state's control responsibility that EPA can apply to any revised air quality standard. Each time air pollution standards (NAAQS) are changed, if interstate pollution transport contributes to the air quality problem, EPA will evaluate whether new emission reductions will be required from upwind states.

- The Clean Air Act requires states to submit plans to eliminate significant interstate pollution transport before they submit plans to meet ambient air quality standards. By determining the amount of emissions that upwind states must eliminate in advance of the time that state pollution transport plans are due, EPA will promote timely reductions in pollution transport. When downwind states design their plans to meet the air quality standards, they will know how much upwind state control is required.

- This will enable the Clean Air Act to work as intended and will help downwind states to attain health-based standards sooner.

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How Proposed Rule Works and Addresses the 2008 Court Action Remanding CAIR

Transport Rule Replaces CAIR

This proposal:

- Responds to the Court ruling remanding the 2005 CAIR and the 2006 CAIR Federal Implementation Plans (FIPs).
- Addresses the December 2008 court decision.
    - The decision kept the requirements of CAIR in place temporarily and directed EPA to issue a new rule addressing the provisions of the Clean Air Act concerning the transport of air pollution across state boundaries.
- Achieves emissions reductions beyond those originally required by CAIR through additional air pollution reductions from power plants beginning in 2012.

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Key Elements of Proposed Transport Rule

- EPA is proposing one approach and taking comment on two alternatives. All three approaches would cover the same states – 31 states and the District of Columbia, set a pollution limit (or budget) for each state and obtain the reductions from power plants.

  1. EPA's preferred approach -- allows intrastate trading and limited interstate trading among power plants but assures that each state will meet its pollution control obligations.
  2. In the first alternative, trading is allowed only among power plants within a state.
  3. In the second alternative, EPA specifies the allowable emission limit for each power plant and allows some averaging of emission rates.

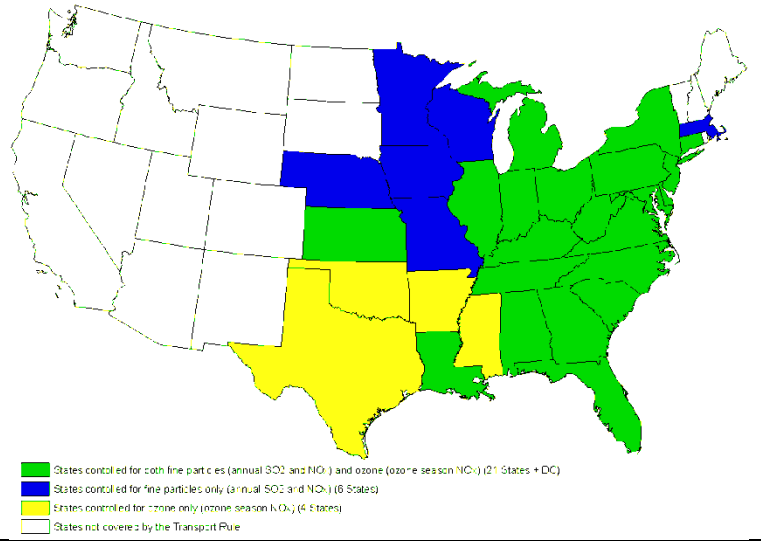
Key Elements of Proposed Transport Rule (con't)

- To assure emissions reductions happen quickly, EPA is proposing federal implementation plans, or FIPs, for each of the states covered by this rule.
  - A state may choose to develop a state plan to achieve the required reductions, replacing its federal plan, and may choose which types of sources to control.

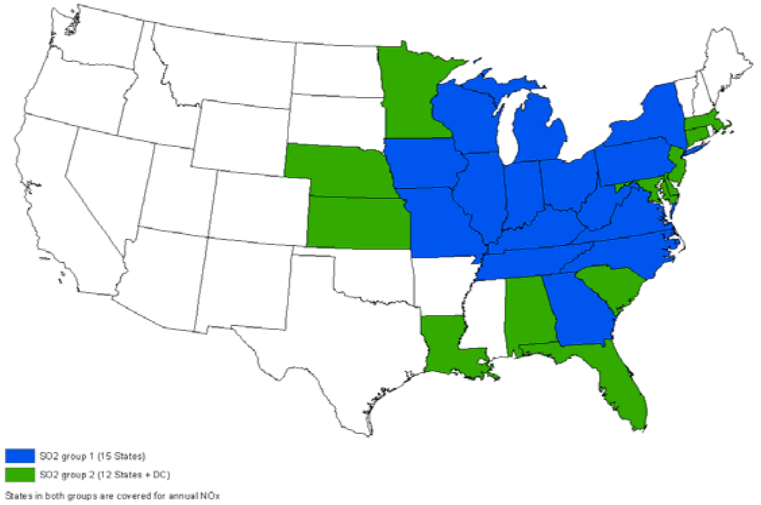
- Proposal defines upwind state obligations to reduce pollution significantly contributing to downwind nonattainment areas based on:
  - the magnitude of a state's contribution,
  - the cost of controlling pollution from various sources, and
  - the air quality impacts of reductions.

Four Separate Control Regions

- Proposal includes separate requirements for:
  - NO_x reductions (2012)
  - Ozone-season NO_x reductions (2012)
- Sets emissions budgets for each state



- Proposal includes separate requirements for:
  - Annual SO_2 reductions
    - Phase I (2012) and Phase II (2014)
    - Two Control Groups
      - Group 1 – 2012 cap lowers in 2014
      - Group 2 – 2012 cap only
- Sets emissions budgets for each state



Proposal Responds to Court Remand

- The methodology used to measure each state's significant contribution to another state:
  - emphasizes air quality (as well as cost considerations) and uses state-specific data and information, and
  - gives independent meaning to the phrase "interfere with maintenance" in section 110(a)(2)(D) of the Clean Air Act.
- The state budgets for SO_2, annual NO_X, and ozone season NO_X are directly linked to the measurement of each state's significant contribution and interference with maintenance.
- The proposed remedy includes provisions to assure that all necessary reductions occur in each individual state.
- The compliance deadlines are coordinated with the attainment deadlines for the relevant NAAQS.
- EPA proposes to allow within-state trading and limited interstate trading to ensure that, in each state, the emissions that significantly contribute to downwind air quality problems will be eliminated.

Compliance

- To meet this proposed rule, EPA anticipates power plants will:
  - Operate already installed control equipment more frequently,
  - Use lower sulfur coal, or
  - Install pollution control equipment such as low NO_X burners, Selective Catalytic Reduction, or scrubbers (Flue Gas Desulfurization).

- CAIR remains in place until this rule is finalized.

Schedule for Final Transport Rule

- Proposal signed on July 6, 2010.
- EPA welcomes comment on the rule. Public comment period ends 60 days after publication in the Federal Register.
- Three public hearings will be held.
- EPA will continue to work with states, tribes, the public, environmental groups, and industry to address comments and to implement the rule when final.
- Final rule expected in late spring 2011.

Upcoming Regulations

Action	*Schedule*
SO_2 NAAQS	Final June 2010
Transport Rule	Proposed June 2010/Final June 2011
Ozone NAAQS Reconsideration	Final Aug 2010
Utility Boiler NSPS and MACT	Propose March 2011/Final Nov 2011
Transport Rule II (NO_X)	Propose Summer 2011/Final Summer 2012
PM NAAQS	Propose Feb 2011/Final Oct 2011

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APPENDIX

Differences between Transport Rule Proposal and CAIR

- The following states are included in this proposal and were not included in CAIR:
  - Nebraska will be required to reduce annual SO_2 and NO_x emissions.
  - Kansas will be required to reduce SO_2, annual NO_x, and ozone-season NO_x emissions.
  - Oklahoma will be required to reduce ozone season NO_x emissions.

- EPA is proposing that some states have different requirements than they did under CAIR. They are:
  - Texas was required to reduce SO_2 and annual NO_x emissions in CAIR; in the Transport Rule it would only be required to reduce ozone season NO_x emissions.
  - Georgia was required to reduce SO_2 and annual NO_x in CAIR; in the Transport Rule it would be required to reduce both of those and ozone season NO_x.
  - Connecticut was required to reduce ozone season NO_x in CAIR; in the Transport Rule it would be required to reduce ozone season NO_x and annual NO_x and SO_2.
  - Massachusetts was required to reduce ozone season NO_x in CAIR; in the Transport Rule it would be required to reduce SO_2 and annual NO_x.
  - Missouri, Iowa, and Wisconsin were required to reduce SO_2, annual NO_x, and ozone season NO_x in CAIR; in the Transport Rule each of these states is required to reduce SO_2 and annual NO_x .
  - Mississippi was required to reduce SO_2, annual NO_x, and ozone season NO_x in CAIR; in the Transport Rule it is only required to reduce ozone season NO_x.

Comparison of SO2 and NOX Emissions from Power Plants in States in the CAIR or Transport Rule Regions* for Each Rule

		2005	2012		2014	
		Actual	Transport Rule	CAIR**	Transport Rule	CAIR**
SO_2 (Million Tons)		9.5	4.1	5.1	3.3	4.6
NO_X (Million Tons)	Annual	2.9	1.6	1.7	1.6	1.7
	Ozone Season	1	0.7	0.8	0.7	0.8

*Emissions totals include states covered by either the Transport Rule or CAIR.

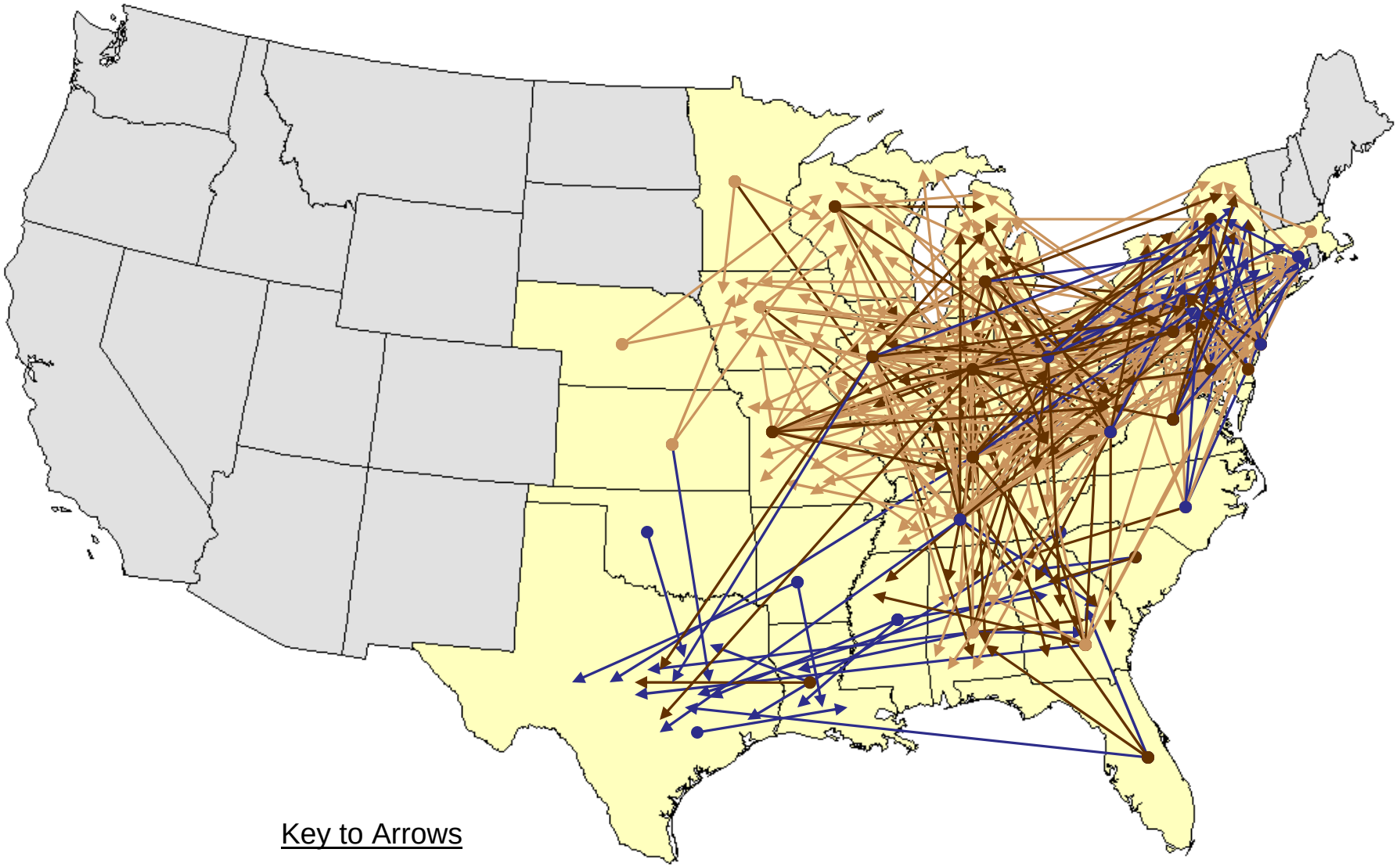
- For PM2.5 (SO2 and annual NOx), the following 30 states are included: AL, CT, DE, DC, FL, GA, IL, IN, IA, KS, KY, LA, MD, MA, MI, MN, MS, MO, NE, NJ, NY, NC, OH, PA, SC, TN, TX, VA, WV, WI.
- For ozone (ozone-season NOx), the following 30 states are included: AL, AR, CT, DE, DC, FL, GA, IL, IN, IA, KS, KY, LA, MD, MA, MI, MS, MO, NJ, NY, NC, OH, OK, PA, SC, TN, TX, VA, WV, WI.

** CAIR SO2 totals are interpolations from emissions analysis originally done for 2010 and 2015. CAIR NOx totals are as originally projected for 2010. This CAIR modeling represents a scenario that differed somewhat from the final CAIR (the modeling did not include a regionwide ozone season NOx cap and included PM2.5 requirements for the state of Arkansas).

2014 Air Quality Problems in Transport Rule Region

- In 2014, we predict that two communities will still not meet the 1997 ozone standard: Houston and Baton Rouge.
- Also, our modeling shows that Allegheny County, PA is not predicted to meet the 1997 standard for fine particles by 2014 even with the Transport Rule.
- We also expect that only 9 communities will not meet the 2006 24-hour standard for fine particles by 2014: Birmingham, Chicago, Detroit, New York, Cleveland, Pittsburgh, Lancaster, Steubenville-Weirton, and Milwaukee

2012 Air Quality Transport: States Linked to Downwind Air Quality Problem



Key to Arrows

- **Linkage of Upwind to Downwind for Ozone**
- **Linkage of Upwind to Downwind for Annual $PM_{2.5}$**
- **Linkage of Upwind to Downwind for 24 hour $PM_{2.5}$**