

Air Quality Modeling for the Transport Rule Proposal

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Air Quality Modeling

- Air quality modeling was used to support the Transport Rule in several ways:
 - Project ozone and PM_{2.5} design values to 2012 and 2014
 - Identify nonattainment and maintenance receptors
 - Contribution assessment
 - Quantify upwind State contributions to downwind ozone and PM_{2.5} nonattainment and maintenance receptors
 - Air quality concentration changes used in the health benefits calculations

Transport Rule Modeling

- CAMx version 5.0
- Nested 36km/12km domain
- 2005 base year MM5 meteorology



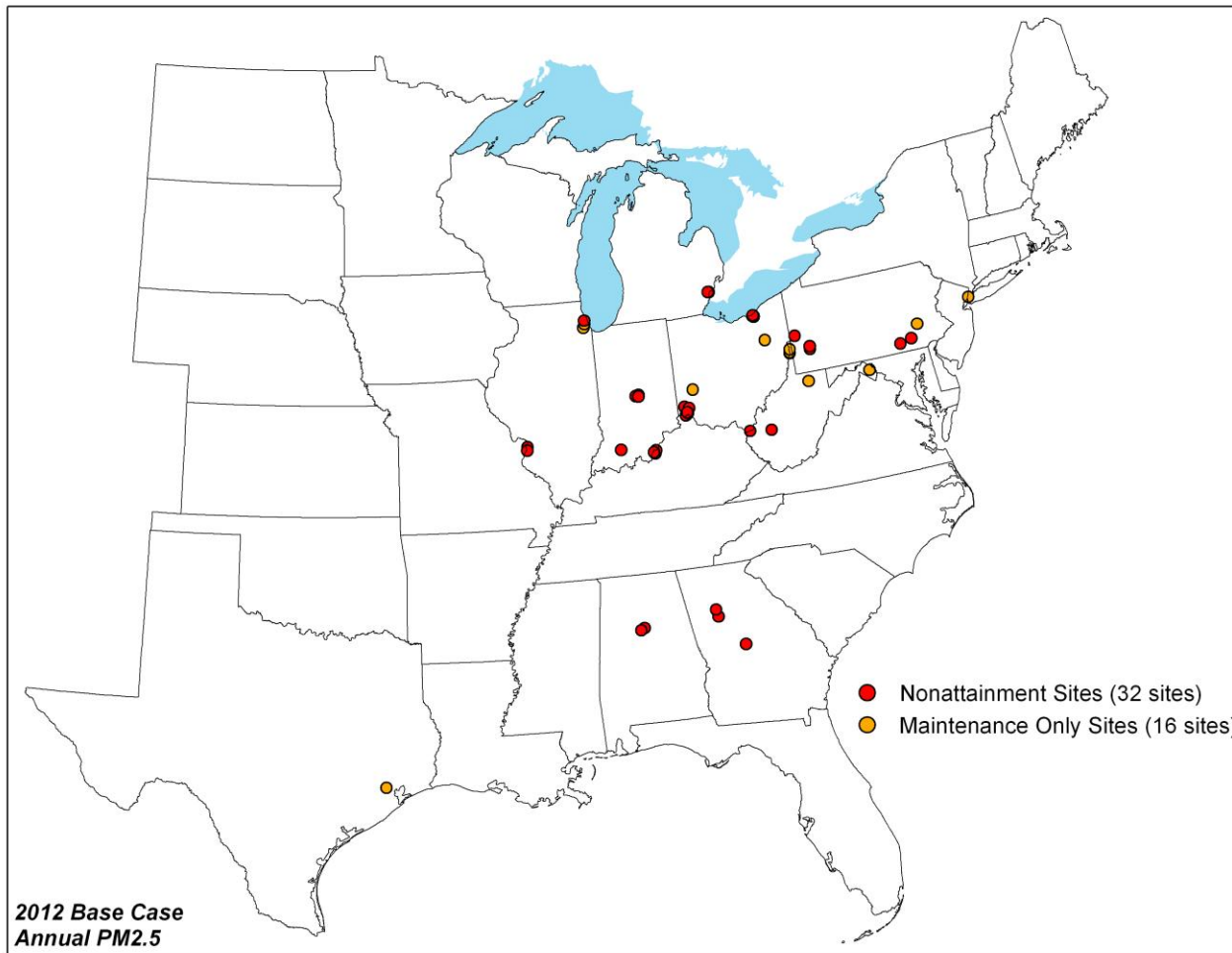
Transport Rule Modeling Scenarios

- Modeling scenarios
 - 2005 base case
 - 2012 “no CAIR” base case
 - Nonattainment and maintenance receptors
 - 2012 ozone and PM_{2.5} CAMx source tagging runs (APCA and PSAT)
 - Contribution calculations
 - 2014 “no CAIR” base case
 - 2014 Transport Rule remedy case
 - Concentration changes between 2014 base and 2014 remedy case used for benefits calculations

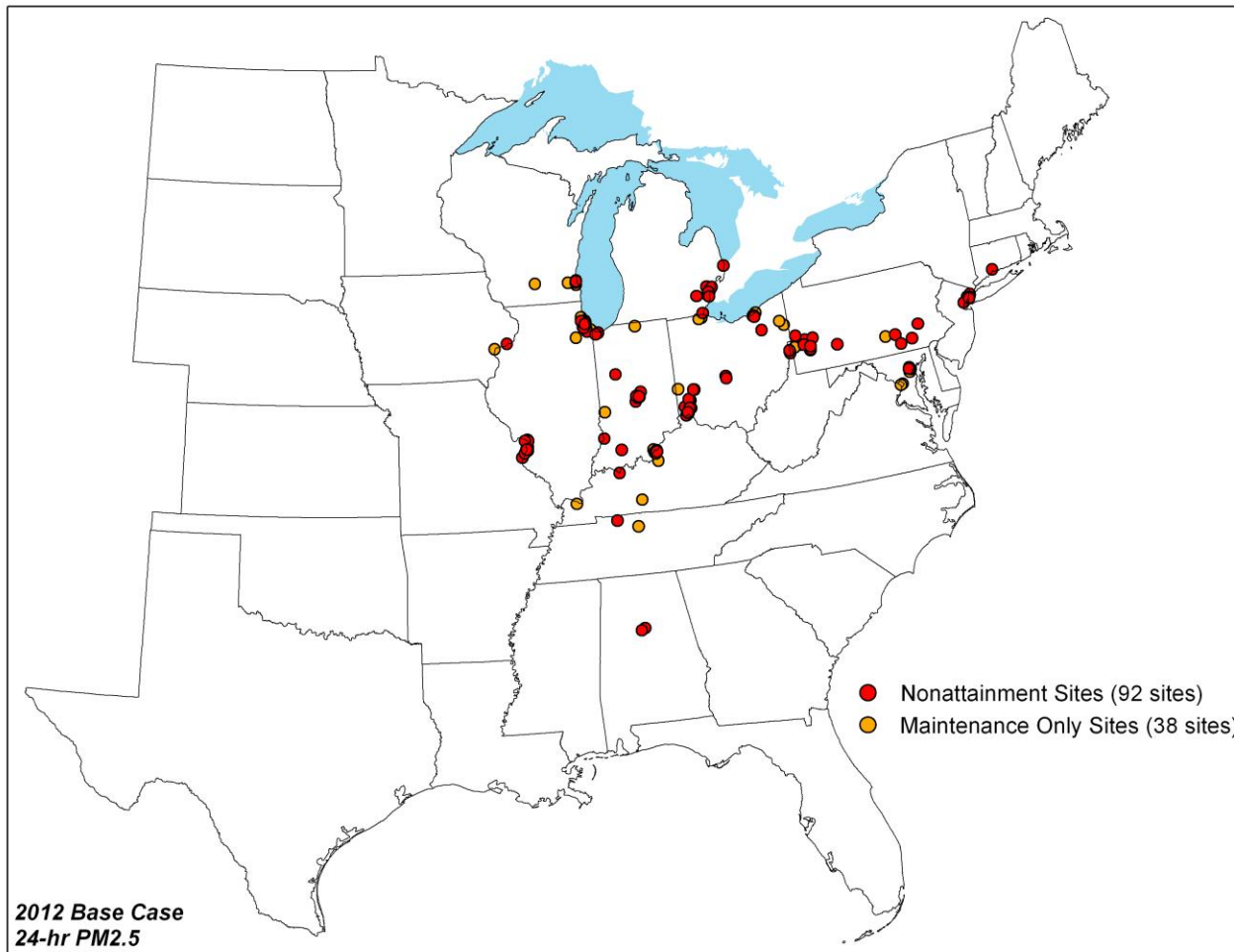
Nonattainment and Maintenance Definitions

- Projected base year design values to 2012 and 2014
 - Modeled attainment demonstration guidance methodology
 - Used MATS
- Nonattainment and maintenance are based on projections of 2003-2007 ambient data
 - Base model year is 2005
 - Used the three design value periods which span 2005 (2003-2005, 2004-2006, 2005-2007)
 - Projected average of the 3 periods (5 year weighted average) **and** individual design value periods
- Future year NAAQS violations (2012 and/or 2014) based on projected **average** design values are nonattainment receptors
- Future year NAAQS violations based on projected **maximum** design values are maintenance receptors
 - Maintenance considers variability due to meteorology and emissions

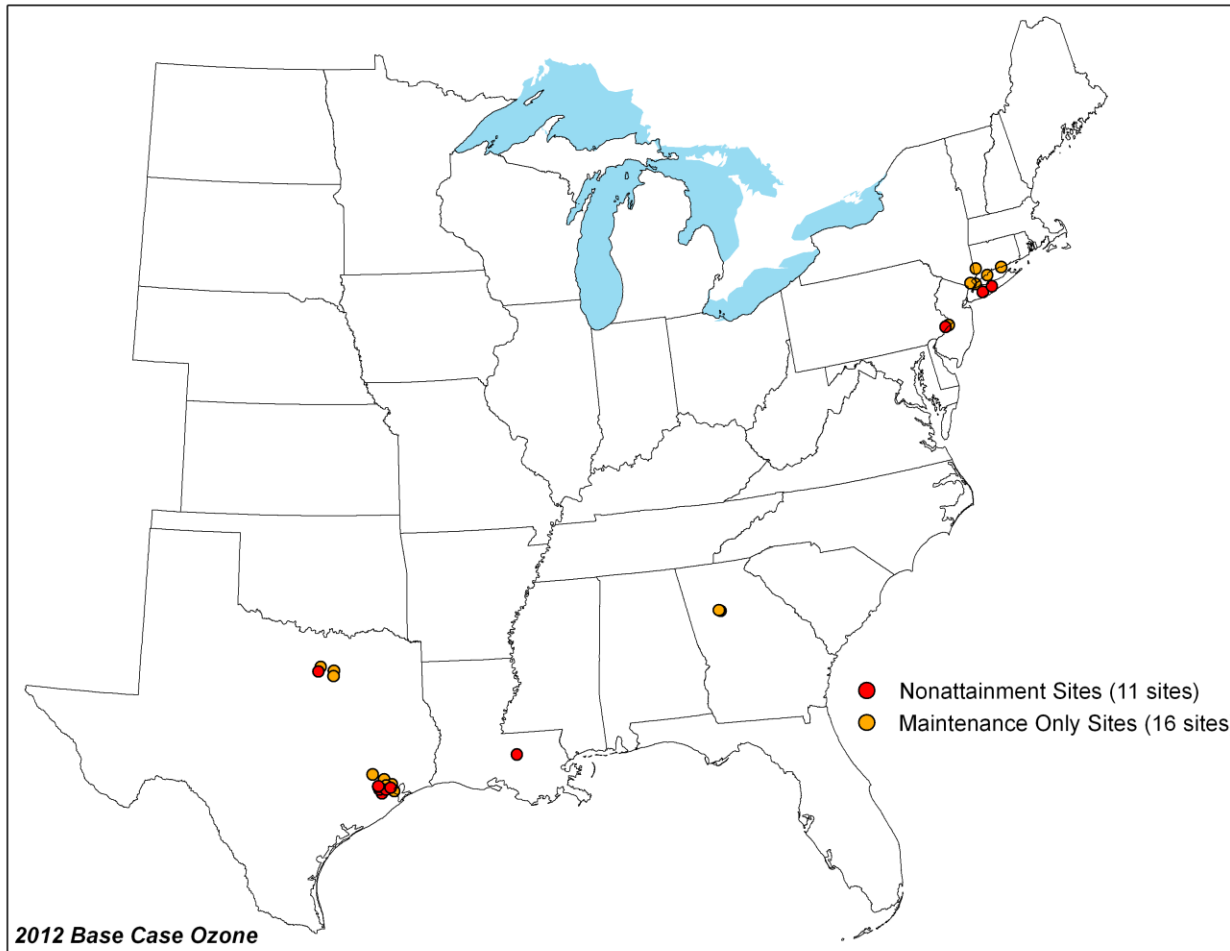
2012 Nonattainment and Maintenance Receptors- Annual PM2.5



2012 Nonattainment and Maintenance Receptors- 24-Hour PM_{2.5}



2012 Nonattainment and Maintenance Receptors- 8-Hour Ozone (0.8 ppm)



Contribution Calculations

- CAMx source apportionment in 2012
- Ozone (APCA) and PM2.5 (PSAT)
- Tagged emissions in 38 States
 - Anthropogenic emissions in each upwind State (emissions were tagged by State boundary, not by grid cell)
 - APCA- NOx and VOC
 - PSAT- sulfate, nitrate, and primary PM2.5 (not SOA)
- Contributions were processed through MATS to get relative contributions at each receptor (see modeling TSD for more details)

Ozone and PM2.5 Contributions

- 8-hr Ozone (0.8 ppm 1997 NAAQS)
 - Contributions to “high” modeled days
 - Minimum of 5 days > 70 ppb at downwind receptor
 - 1% contribution ≥ 0.8 ppb
- Annual avg PM2.5 (15.0 $\mu\text{g}/\text{m}^3$ 1997 NAAQS)
 - Contributions to all modeled days
 - 1% contribution ≥ 0.15 $\mu\text{g}/\text{m}^3$
- 24-Hour avg PM2.5 (35 $\mu\text{g}/\text{m}^3$ 2006 NAAQS)
 - Contributions to top 10% highest modeled days in each quarter
 - 1% contribution ≥ 0.35 $\mu\text{g}/\text{m}^3$

Health Benefits

- CAMx 2014 base and 2014 TR remedy model runs
- MATS generated “fused” ozone and annual PM2.5 spatial fields
 - 2014 remedy – 2014 base
 - Spatial fields are fed into BenMAP

Further Information and Details

- Main TR website
 - <http://www.epa.gov/airtransport/>
- TR Preamble
 - <http://www.gpo.gov/fdsys/pkg/FR-2010-08-02/pdf/2010-17007.pdf#page=1>
- Air Quality Modeling TSD
 - http://www.epa.gov/airquality/transport/pdfs/TR_AQ%20Modeling_TSD.pdf
- Emissions Inventory TSD
 - http://www.epa.gov/airquality/transport/pdfs/TR_Proposal_Emissions_TSD.pdf
- Significant Contribution Analysis TSD
 - http://www.epa.gov/airquality/transport/pdfs/TSD_analysis_to_quantify_significant_contribution_7-8-10.pdf