IMPACTS OF THE CROSS-STATE AIR POLLUTION RULE ON NORTHEASTERN STATES

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REMINDER

- **The issue being addressed by the Cross-State Air Pollution Rule (CSAPR) is the impact of air emissions generated in upwind states on downwind states.**

- **Emissions from upwind states that contribute significantly to air quality problems in downwind states are not allowed under CAA 110(a)(2)(d.)**

REMINDER

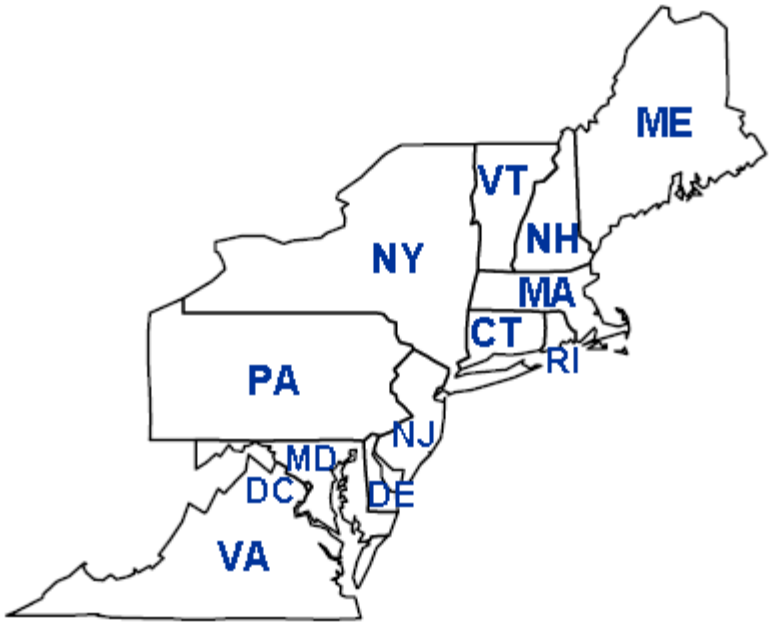
Estimated benefits and costs of the USEPA Cross-State Air Pollution Rule

Category	Monetized benefits or costs (2007$)
Estimated public health benefits	$110 -$280 billion in 2014
Estimated public welfare benefits	$4.1 billion in 2014
Estimated costs for electricity-generating industry	$1.4 billion in 2012; $0.8 billion in 2014

U.S. EPA, *Regulatory Impact Analysis for the Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone in 27 States; Correction of SIP Approvals for 22 States*,
Docket ID No. EPA-HQ-OAR-2009-0491, U.S. EPA Office of Air and Radiation, June 2011. Available at http://www.epa.gov/airtransport/pdfs/FinalRIA.pdf.

Ozone Transport Commission

- OTC was Established by the CAAA (will celebrate its 20th anniversary this week),
- Home to 65 million people,
- All OTR states are treated as moderate non-attainment with many areas designated as severe,
- OTC is responsible for advising EPA on transport issues and for developing and implementing regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions.



Ozone Conceptual Model

Update to “The Nature of the Ozone Air Quality Problem in the Ozone Transport Region: A Conceptual Description” NESCAUM report - October 2006. With lower standard:

- More ozone exceedances and a longer ozone season
- Transport will play a greater role
  - Transport component can often be > 75 ppb standard
- High ozone levels at remote and high elevation area monitors are indicative of transport
- Need for national rules in addition to regional rules will increase and is critical

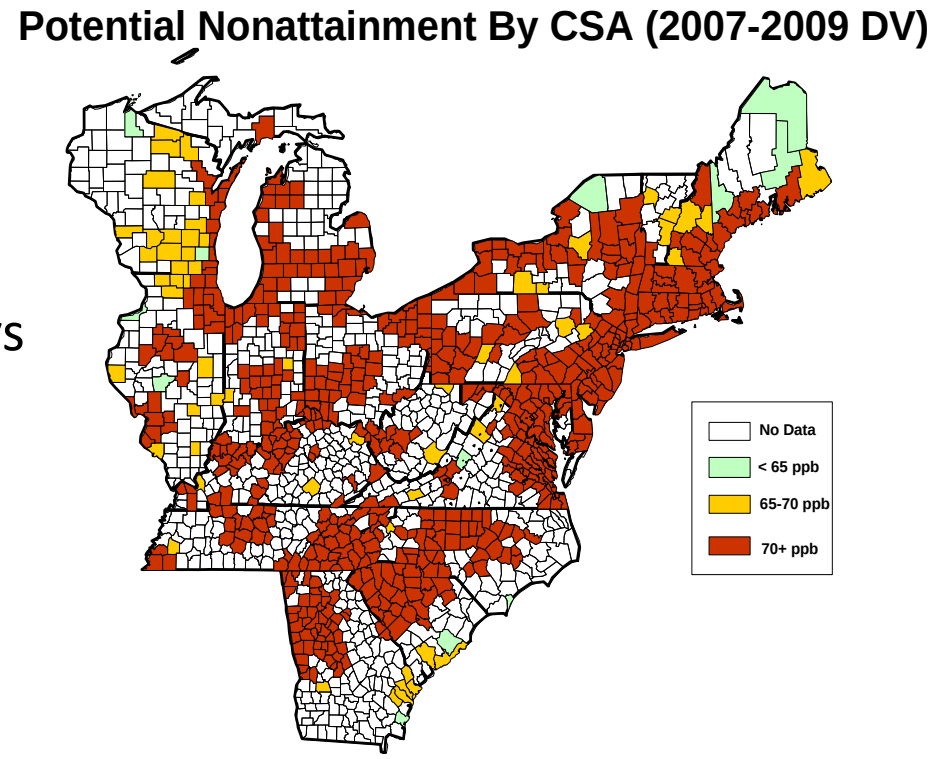
Ozone Conceptual Model Update: New Considerations & Conclusions

Ozone Formation and Controls

- Ozone formation can be NOx-sensitive during some times of day and VOC-sensitive during others
- Need for NOx reductions across a larger region, combined with localized VOC reductions in urban centers
- Regional NOx SIP Call reductions showed greater ozone improvements than predicted by modeling

NOx is a major problem in the OTR

- Contributes to ozone & PM 2.5
  - Reduces lung function, aggravates asthma & contributes to premature death
  - Acid rain damages forests and erodes structures
- Causes eutrophication of waterways
  - e.g., Chesapeake Bay, Adirondacks
  - Contaminates water, affects plant & animal health
- Reduces visibility in parks and wilderness areas
  - Mars vistas and views for visitors to our national treasures



EGUs are largest & most cost-effective category for stationary source NOx reductions

- **NOx Estimated Cost per Ton (2015)*:**
  - **$700 average cost**
  - **$1,600 marginal cost**

*Source: EPA CAIR analysis, 2004

OTC Measures Under Review

NOx Measure	State(s) Rule Based On	Emissions Reduction	Cost
Oil and Gas Fired Boilers serving EGUs	DE, NJ, MA, MD, NY	139 TPD OTR	$2,730 to $21,800 per ton
Coal Fired Boilers serving EGUs	TBD	TBD	TBD
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)
HEDDCT EGUs	NJ	20 TPD OTR	WI: $44,000 per ton HEDDCT (or $4400 seasonal)
Stationary Generator Regulation (DG)	DE, MA, MD, NJ	TBD	$39,700 to $79,700 per ton per day
Energy Security /Efficiency	TBD	TBD	TBD
Natural Gas Compressor Stations	TBD	TBD	TBD

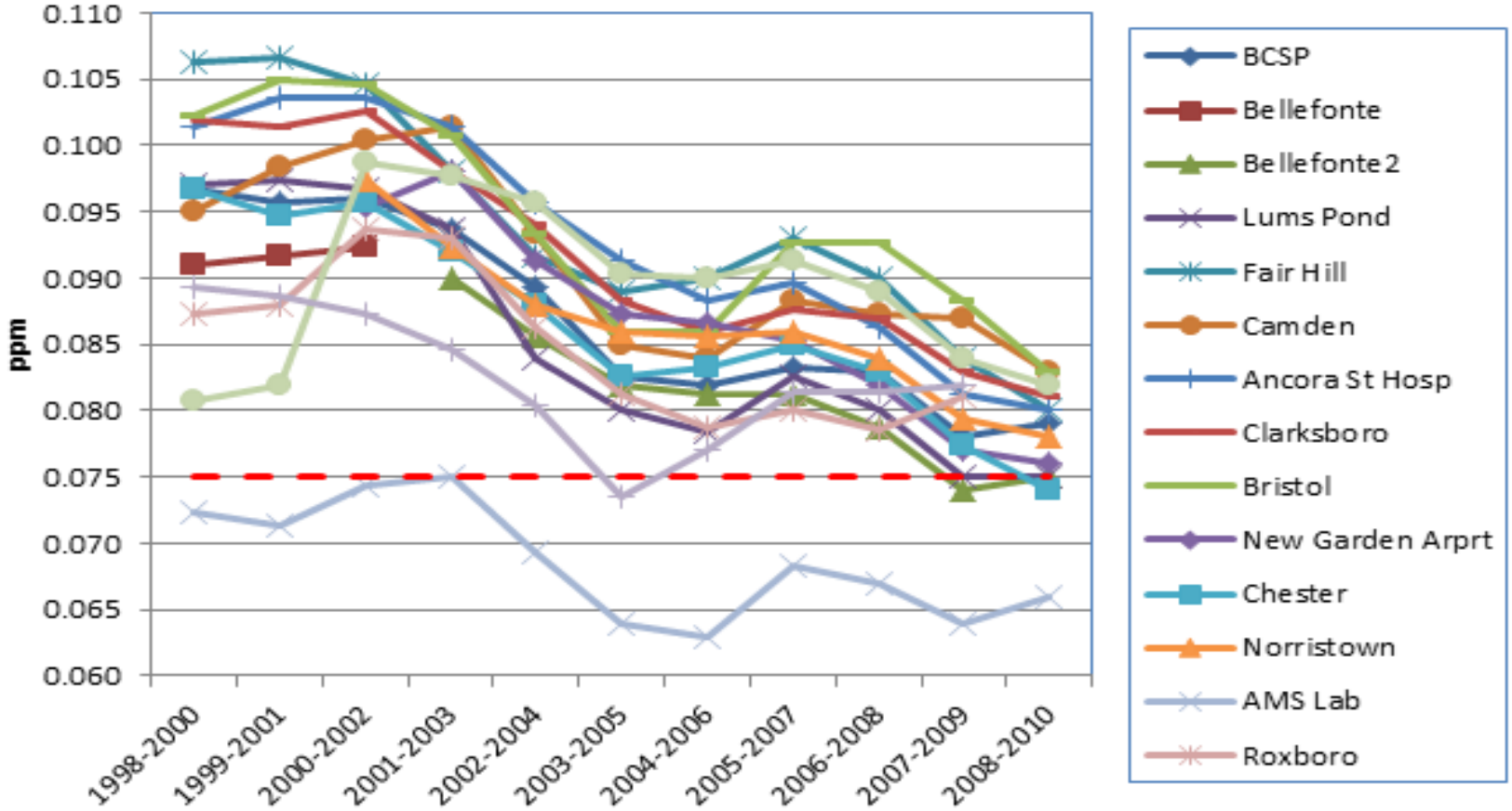
OTC Measures Under Review

VOC Measure	State(s) Rule Based On	Emissions Reduction	Cost
AIM Rule Update	CA	60 TPD OTR	$2,240 per ton
Autobody Refinishing	CA	31 TPD OTR	$2,860 per ton
Consumer Products	CA	19 TPD OTR	$7,700 per ton
Solvent Degreasers	MD, CA	81 TPD OTR	$1,400 per ton
Stage 1 and 2 Vapor Recovery	TBD	TBD	TBD
Large Above Ground Storage Tanks	MD, NJ	TBD	$2,288 to $29,000 per ton (Industry estimate: $47,000 /ton) (BP - Carson, CA spent $15.4 million to dome 32 tanks)

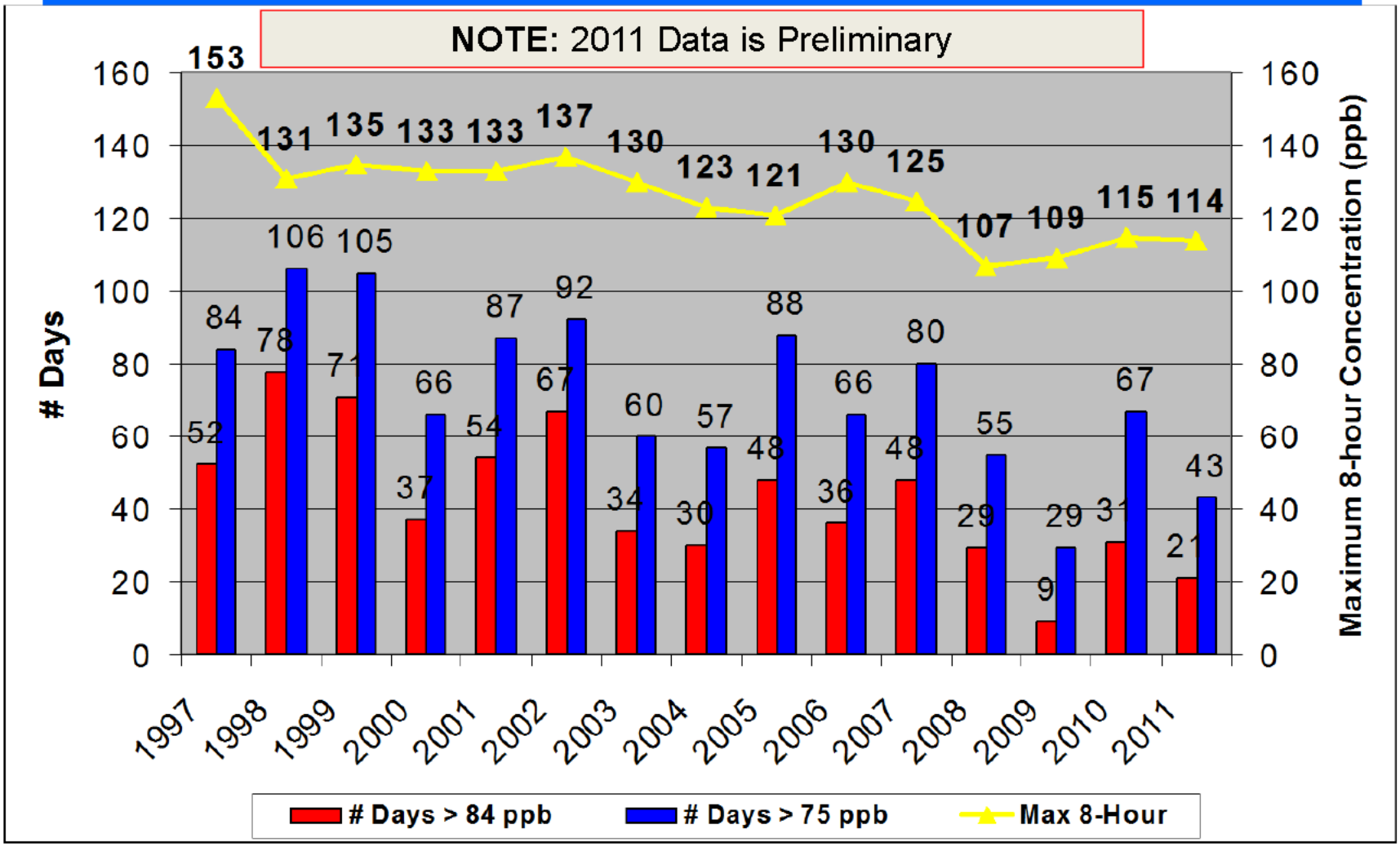
OTC Adopted Measures

NOx Measure	Rule Basis - States	Year Adopted?	Emissions Reduction
Oil and Gas Fired Boilers serving EGUs	DE, NJ, MA, MD, NY	2010	139 TPD OTR
New Small Gas Boilers	CA, TX	2010	53 TPD OTR
HEDDCT EGUs	NJ	2010	20 TPD OTR
Stationary Generator Regulation (DG)	DE, MA, MD, NJ	2010	TBD
VOC Measure	**Rule Basis - States**	**Year Adopted?**	**Emissions Reduction**
AIM Rule Update	CA	2010	60 TPD OTR
MVMERR (Autobody Refinishing)	CA	2009	31 TPD OTR
Consumer Products	CA	2010	19 TPD OTR
Large Above Ground Storage Tanks	MD, NJ	2010	TBD

Philadelphia CBSA Ozone 8-hour Design Value Trends



OTR Ozone Day Trends 1997-2011



What OTR Needs for Attainment

"Scenario 3" vs "Scenario 4"

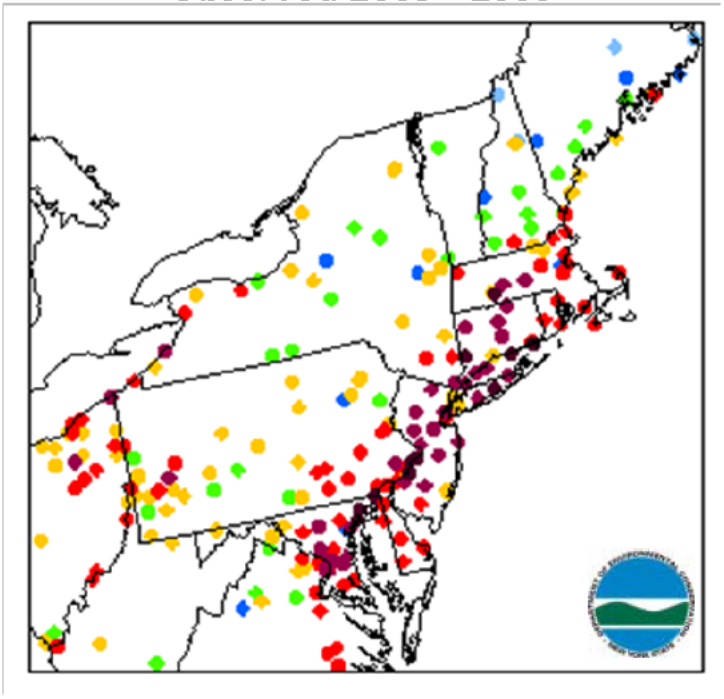
- Both approximate OTC's recommendations
- Theoretical reductions applied:

Scenario 3	Scenario 4
Scales from 2007 (or 2005)	Uses best available 2020 data except where noted
Domain-Wide NOx Reductions • Point: 65% (includes EGUs and ICI boilers/cement kilns) • Onroad: 75% (LEV3) • Nonroad: 35%	Domain-Wide NOx Reductions • Point: 65% (EGUs) from 2007 • Onroad: 70% (LEV3) from 2007
Domain-Wide VOC Reductions • 30% man-made sectors	Domain-Wide VOC Reductions • 30% EGU & On-road sectors from 2007
OTR Only: Extra 5% NOx	OTR Only: Extra 5% NOx

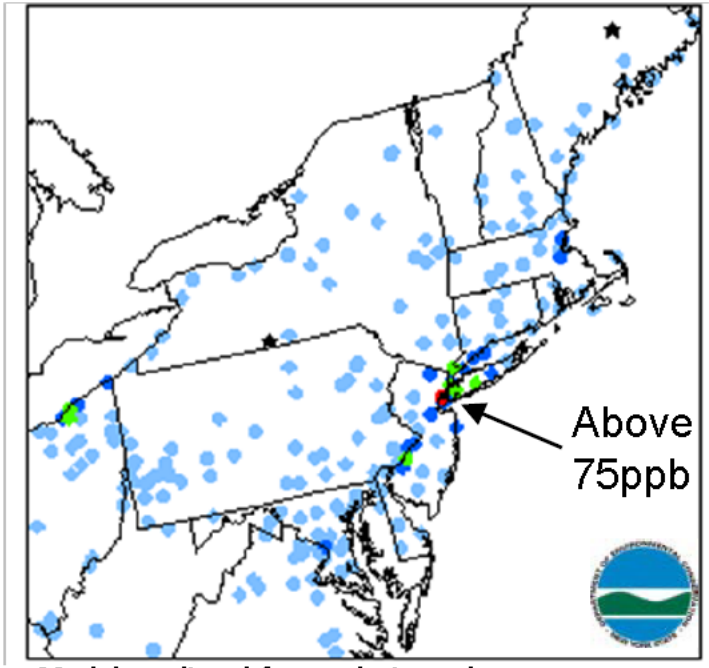
Level 1 Screening "Scenario 3"

Screening of OTC Recommended Measures Predicted Nearly Full Attainment of 75ppb NAAQS!
All locations would meet the 84ppb version of the NAAQS

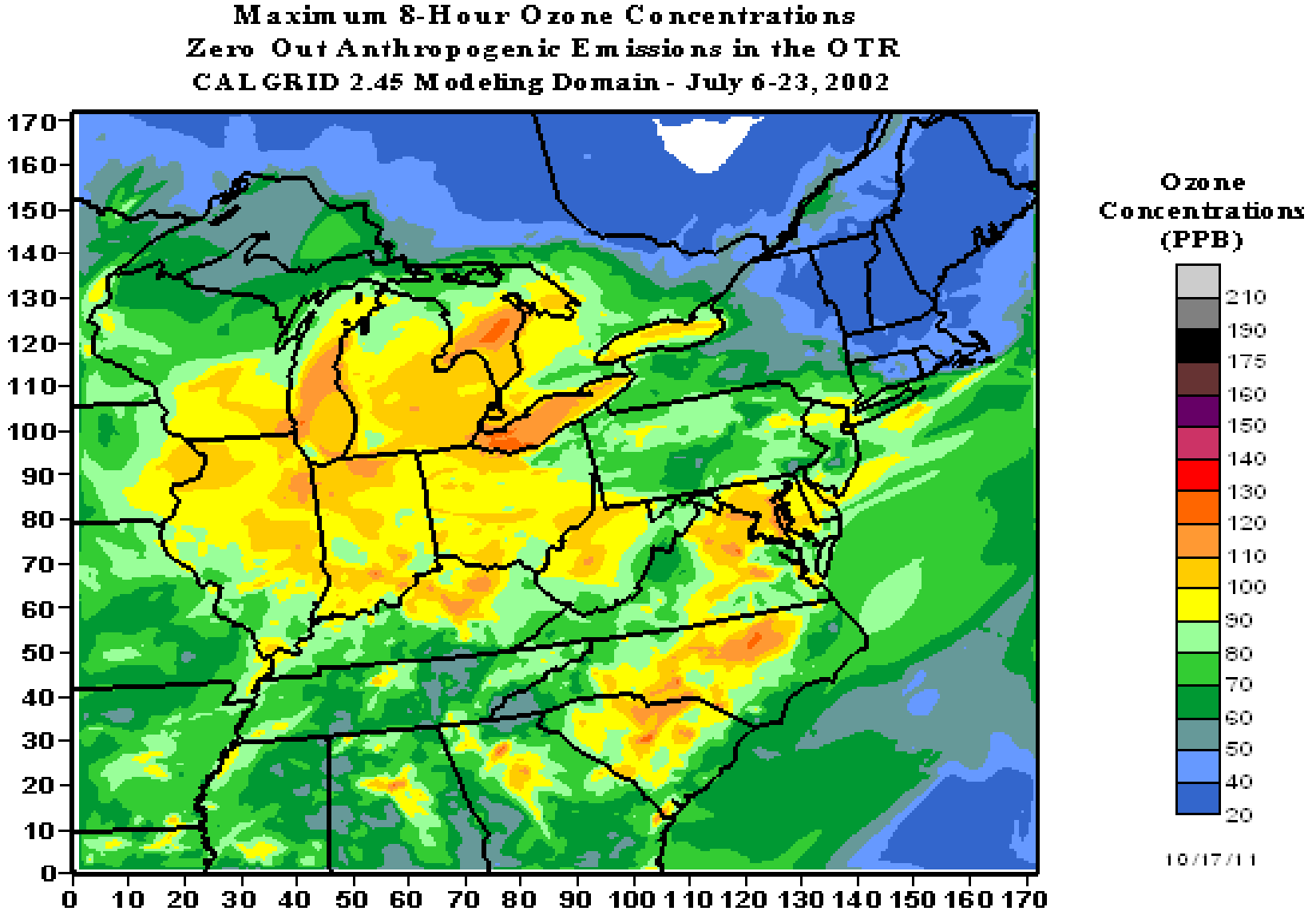
Observed 2005 - 2009



OTC Recommendations "Scenario 3"



Model predicted future design values



State of Delaware modeling analysis

What Impact would Loss of CSAPR Have on OTR?

- Loss of progress and Negative Health Impacts - Emissions in the upwind states may go up which would increase ozone levels in OTR,
- Loss of definition - EPA defined 1% of NAAQS for determining “significant contribution” in the rule,
- Loss of process - EPA created a “policy construct” (process) to proactively deal with ozone transport that can be used to address future revisions to the NAAQS.

What Impact would Loss of CSAPR Have on OTR?

- Continued economic inequity between upwind states that are causing OTR's pollution and the downwind OTR states that have to pay for controls and adverse health impacts,
- Delay in reaching attainment which means additional adverse health outcomes for the people who live in OTR.

Framework for Air Quality Planning*

- Timely action is critical in order to protect public health;
- States must act locally to address air pollution;
- While acting locally, states must also consider their impacts downwind in addition to in-state impacts when developing state implementation plans (SIPs), and ameliorate such impacts through SIPs;
- Regional actions have been and can continue to be effective;
- To be effective on a regional level, states working together must work off of a level playing field;
- National rules are important and will play a more critical role as more states and nonattainment areas become involved in air quality planning

* Update to "The Nature of the Ozone Air Quality Problem in the Ozone Transport Region: A Conceptual Description"