

Air Quality Analyses

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Lake Michigan Air Directors Consortium

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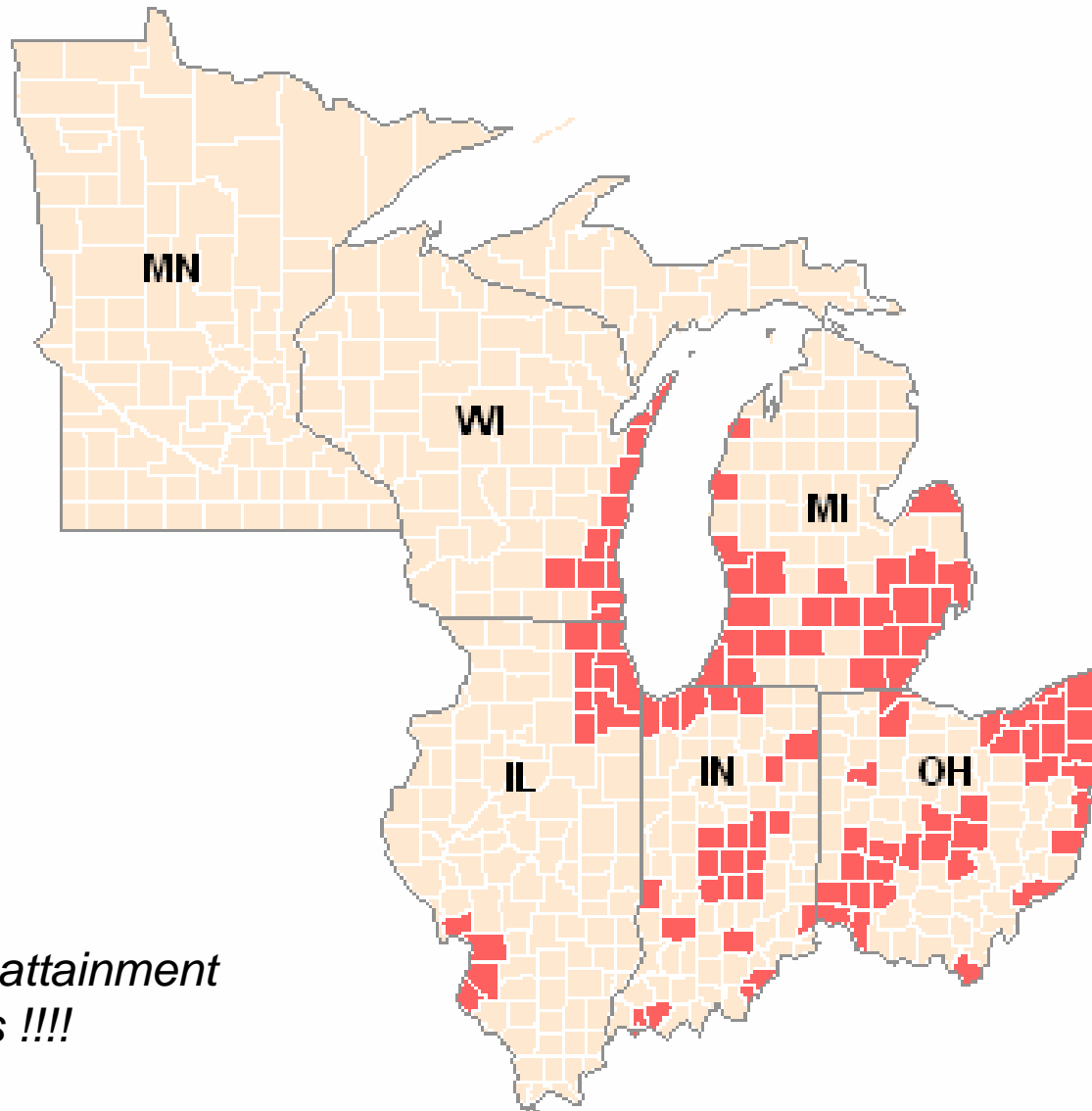
Overview

- Current Air Quality (O_3 , $PM_{2.5}$, and regional haze)
- Regional Planning Efforts
 - Schedule
 - Preliminary control strategy analyses

Current Air Quality

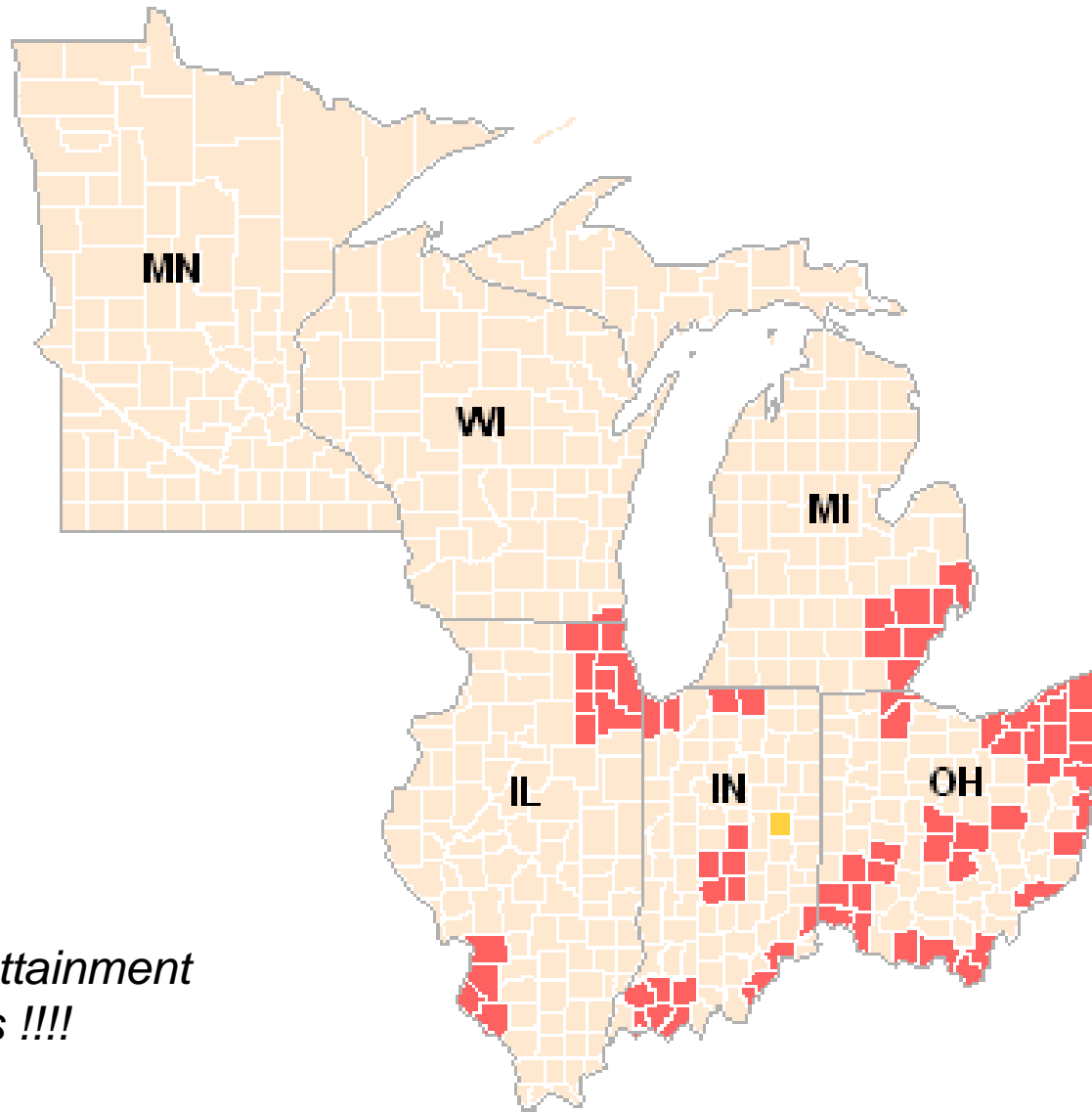
- O_3
- $PM_{2.5}$
- Regional Haze

8-Hour Ozone Nonattainment Areas (Region V)



*104 Nonattainment
Counties !!!!*

PM_{2.5} Nonattainment Areas (Region V)



*70 Nonattainment
Counties !!!!*

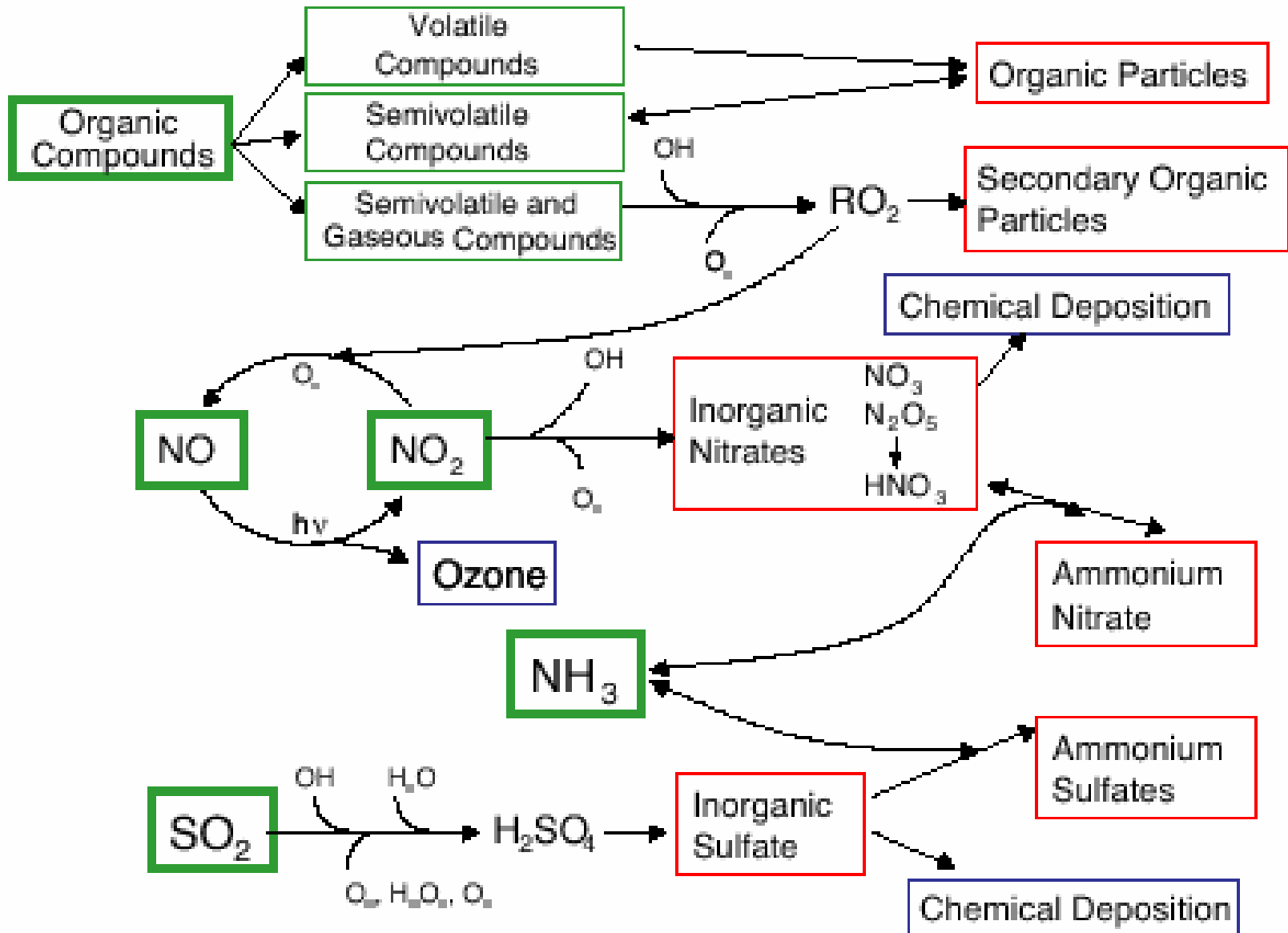
Isle Royale National Park, MI



Map of 156 National Park and Wilderness Areas Protected by EPA's Regional Haze Rule

Legend
NP = National Park
WA = Wilderness
IP = International Park

“One Atmosphere”



Regional Planning Efforts

- Schedule
- Preliminary control strategy work

Regulatory Schedule

	Ozone	PM_{2.5}	Haze
Nonattainment Designations	April 15, 2004 (June 15, 2004)	Dec 17, 2004 (April 5, 2005)	-----
SIPs due	June 2007	April 2008	Dec 2007
Attainment dates	2007/2009/2010	2010	2018 (2064)

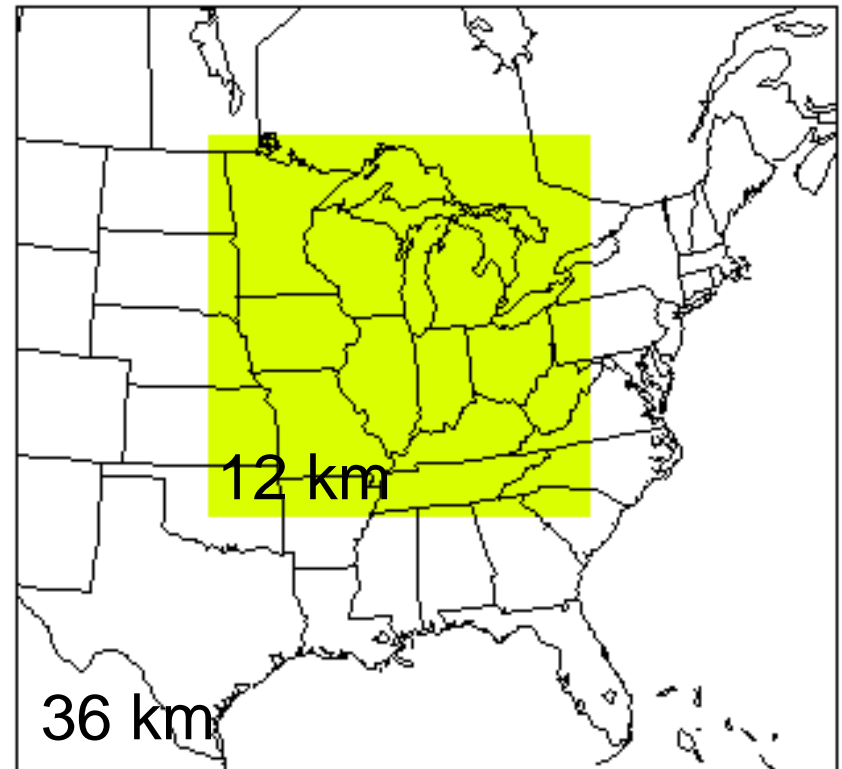
Technical Analyses: Modeling

Model: CAMx

Domain/Grid: Eastern U.S.
(36 km), Midwest (12 km)

Year: 2002 (full year)
- PM/haze, 36 km

2001, 2002, 2003
(summer) – O₃, 12 km



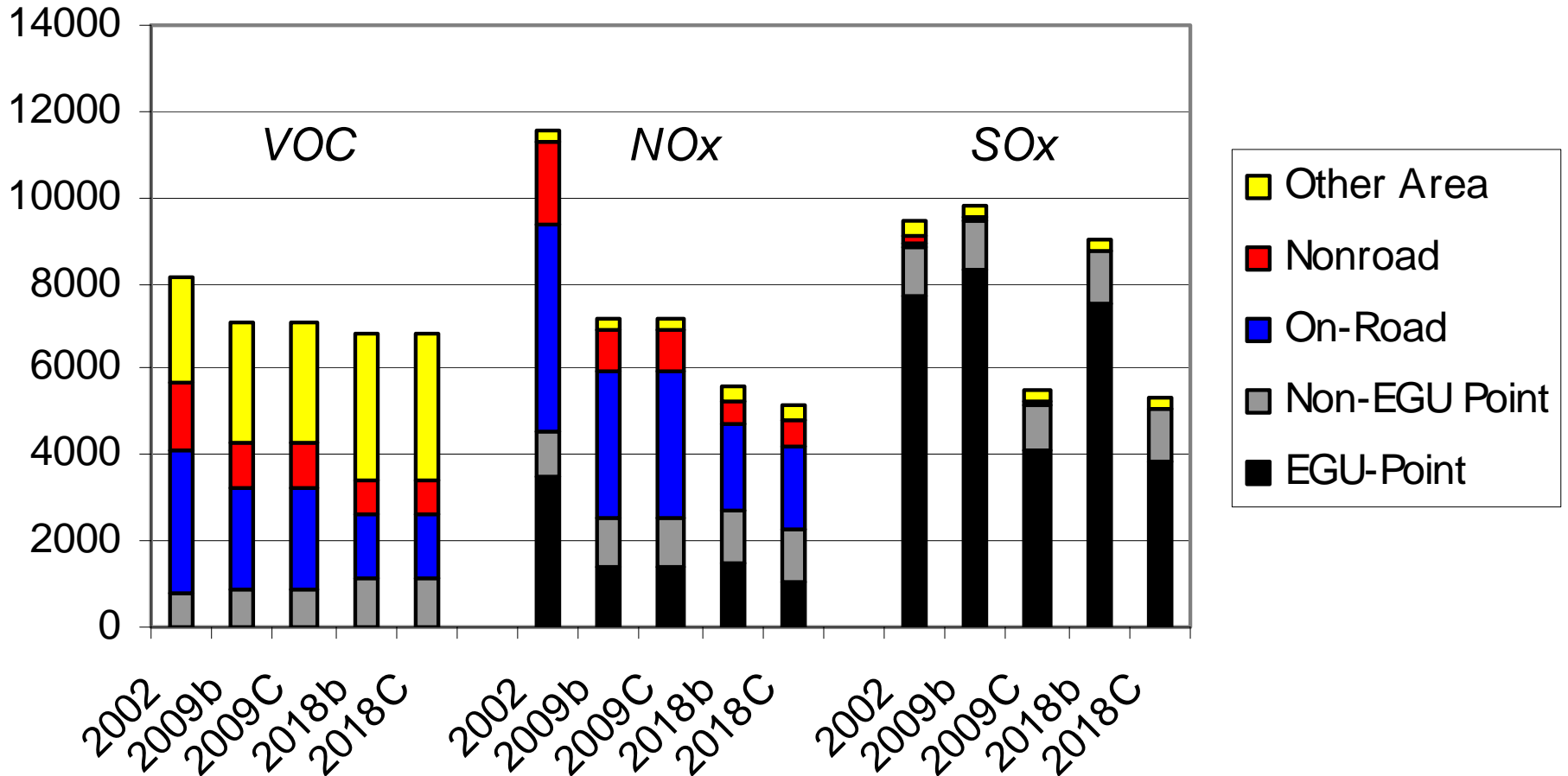
Control Strategies

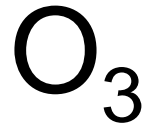
- Scenario 1 – “*on the books*” controls
- Scenario 2 – “*on the way*” controls
(CAIR)

“On the books” Controls

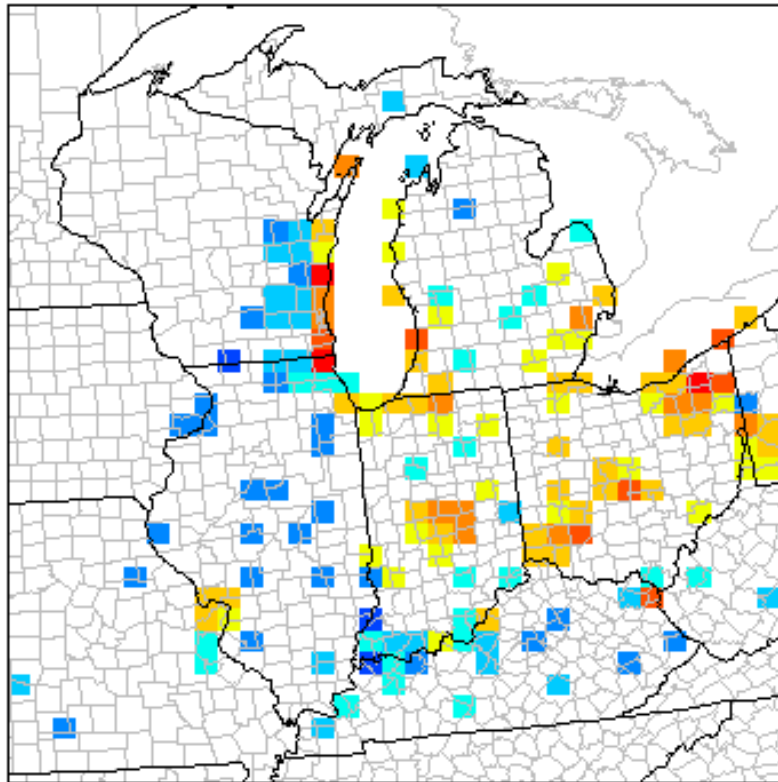
- Current state/local rules to meet 1-hour ozone requirements (e.g., motor vehicle I/M, reformulated gasoline, and NO_x SIP Call)
- Heavy-duty diesel (2007) engine standard/Low sulfur fuel
- Federal control programs incorporated into NONROAD model (e.g., nonroad diesel rule), plus the evaporative Large Spark Ignition and Recreational Vehicle standards
- Federal railroad/locomotive standards
- Federal commercial marine vessel engine standards
- Tier II/Low sulfur fuel
- Title IV for EGUs (Phases I and II)
- VOC 2-, 4-, 7-, and 10-year MACT standards
- Combustion turbine MACT
- Industrial boiler/process heater/RICE MACT

Emissions (5-State Region)

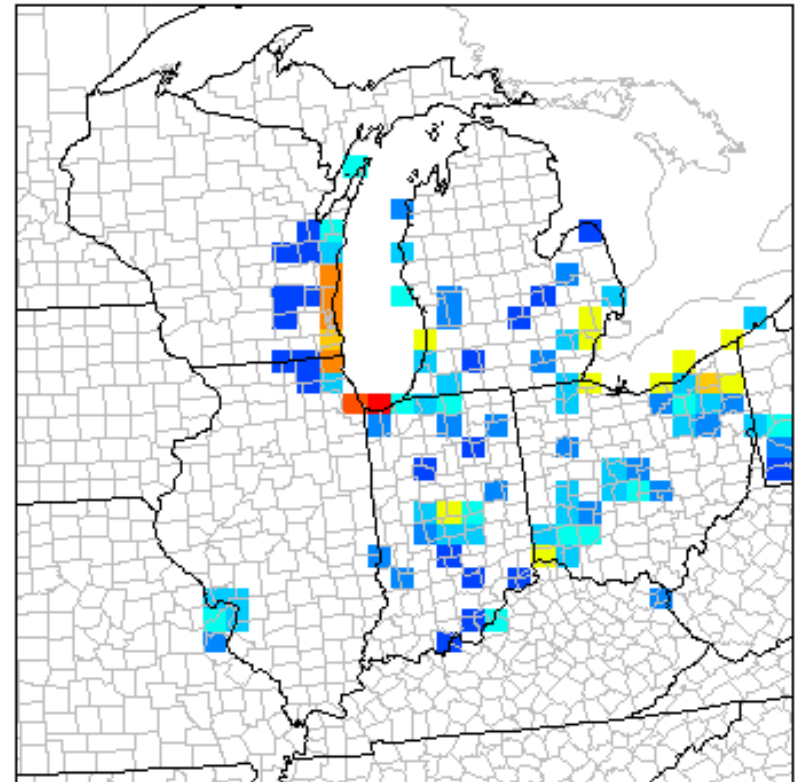
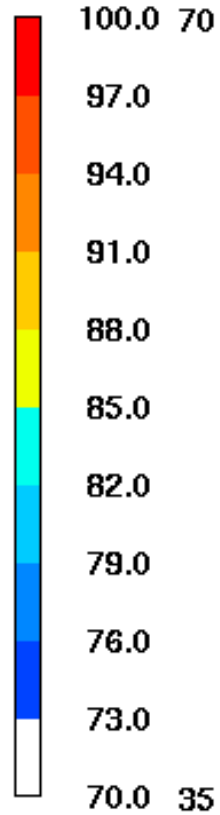


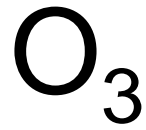


2002 Observed

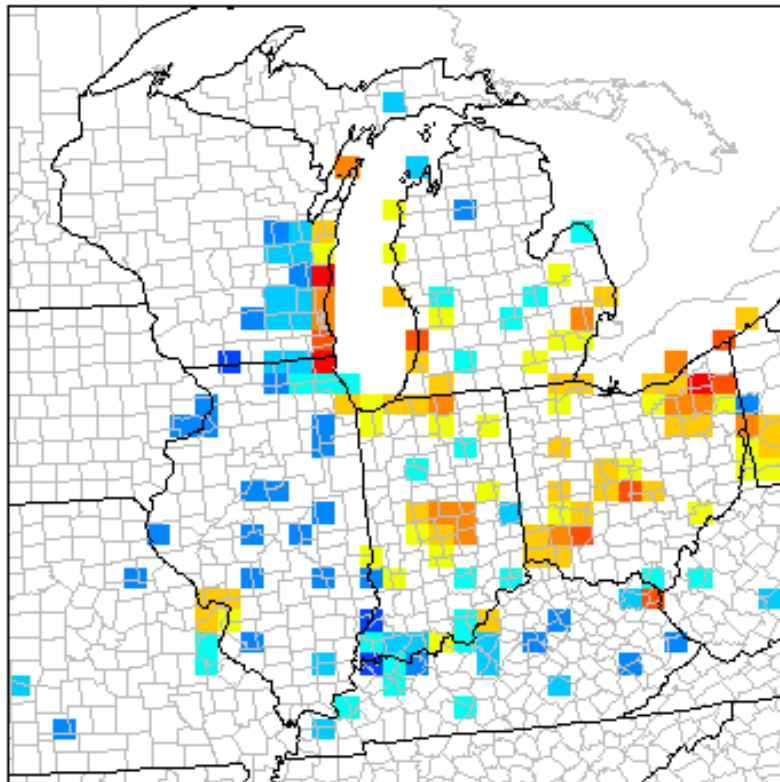


2009 "On the books"

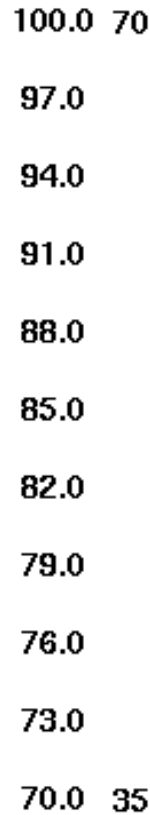
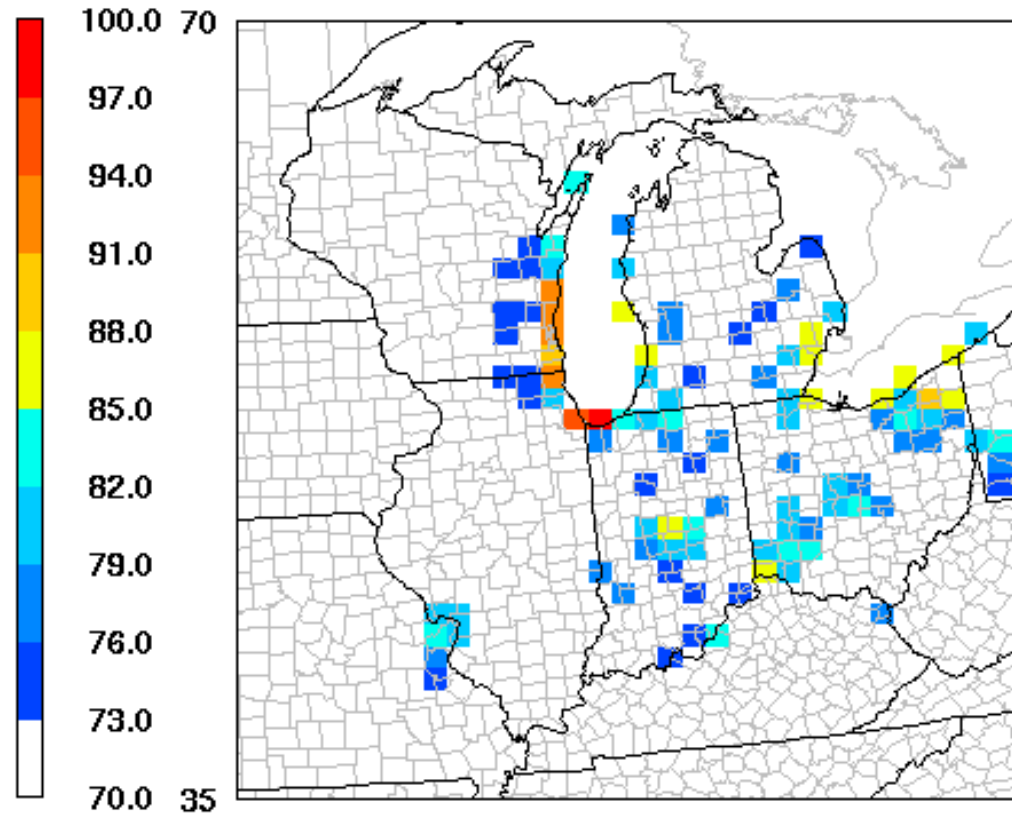




2002 Observed

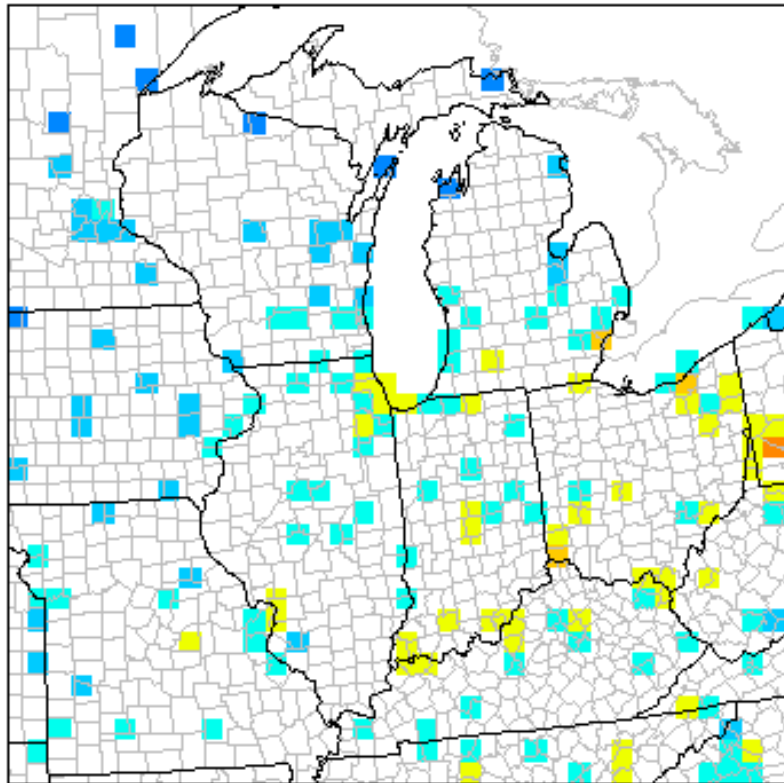


2009 "On the way"

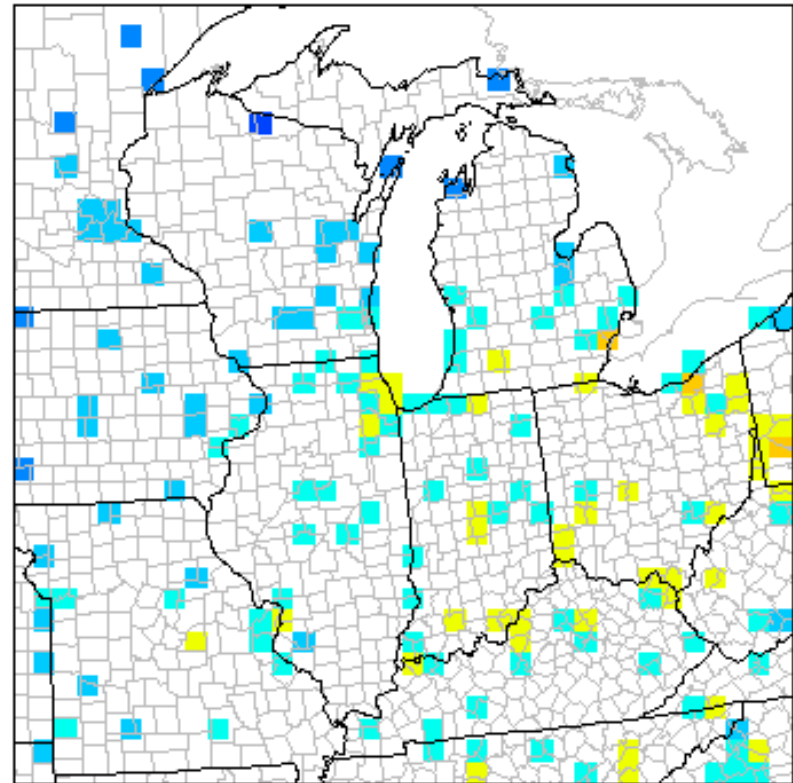
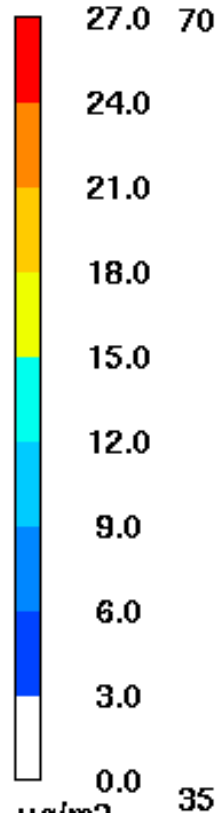


PM_{2.5}

2002 Observed



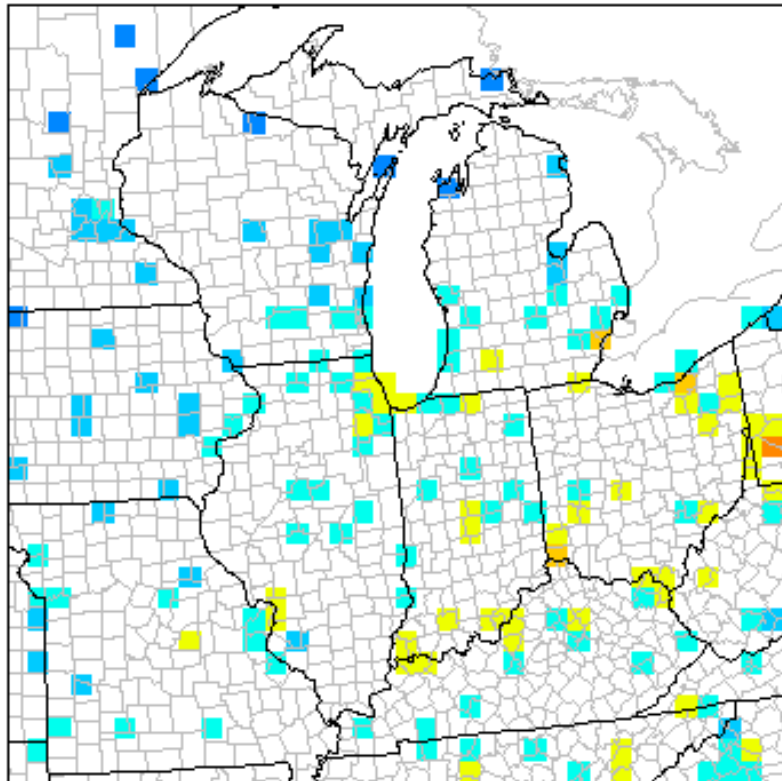
2009 "On the books"



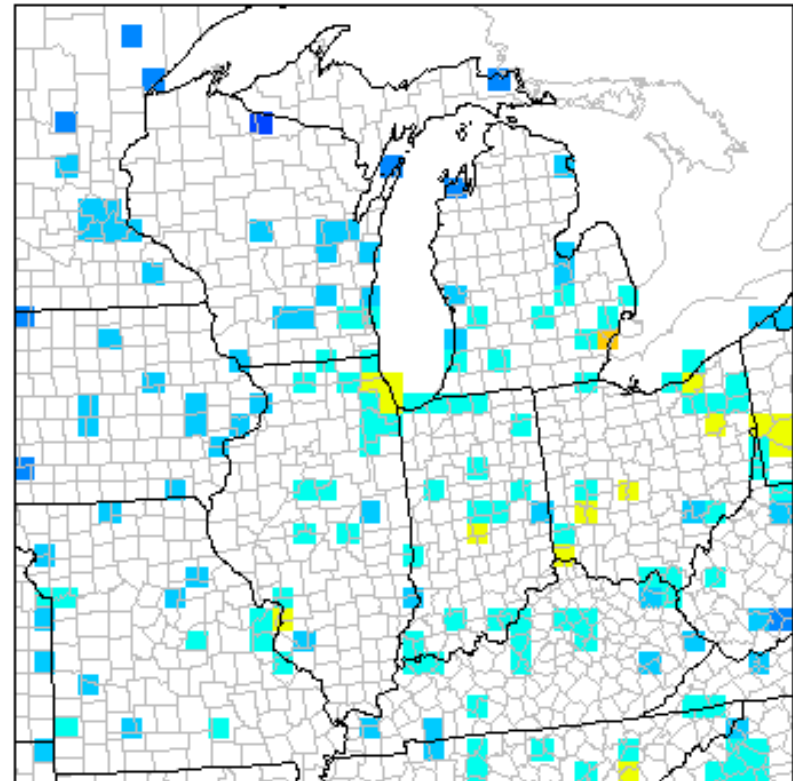
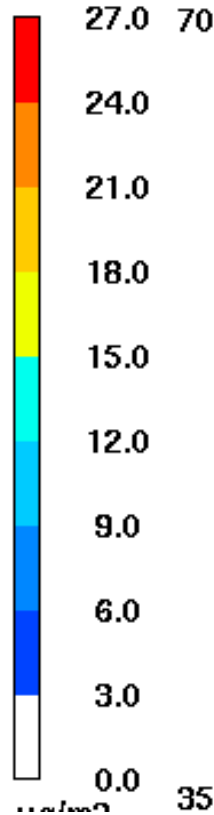
35

PM_{2.5}

2002 Observed



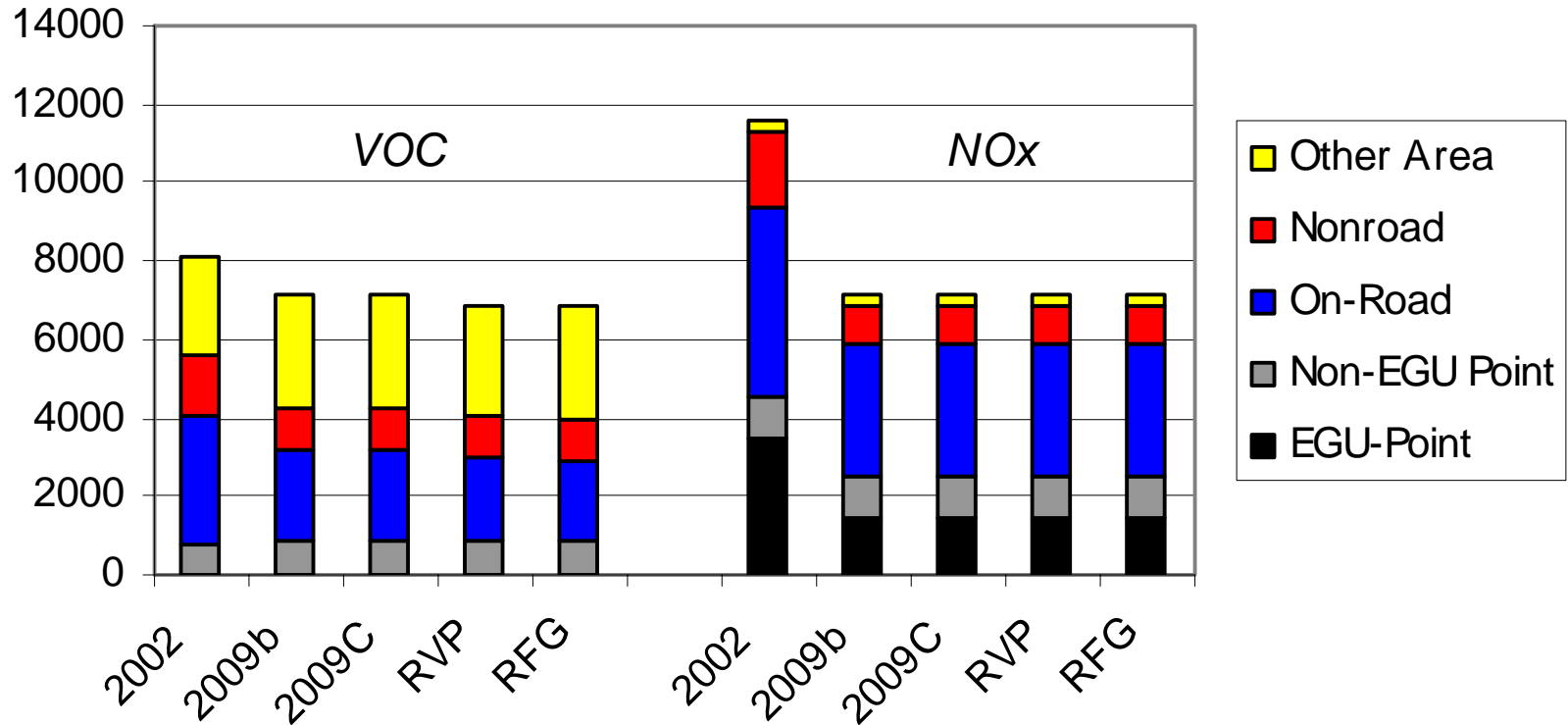
2009 "On the way"



Additional Ozone Sensitivity Runs

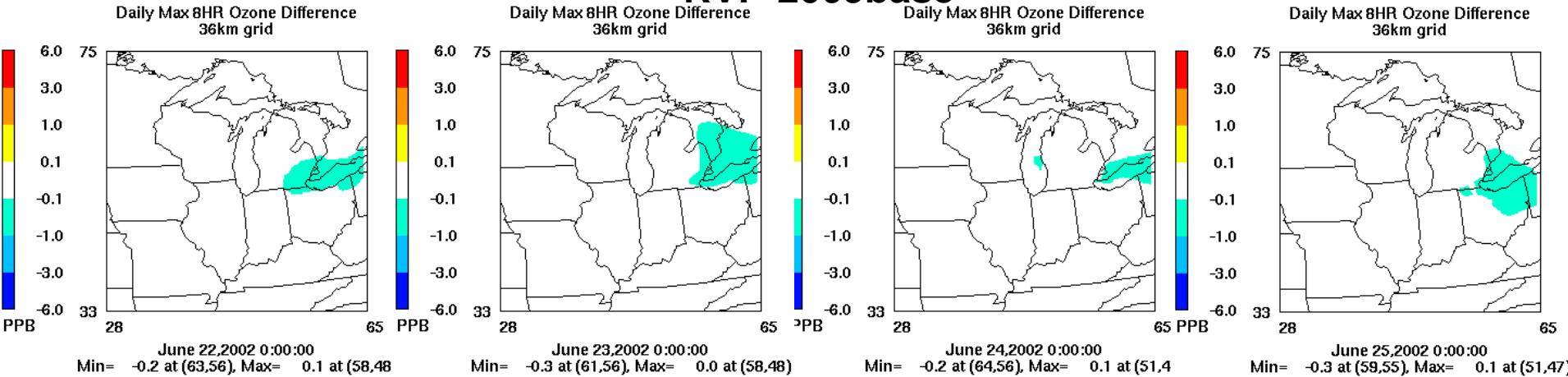
- Low RVP (7.0 psi), plus low sulfur in 5-state region
- RFG in 5-state region
- Applied to 2009base
- 36km grid
- Summer 2002
- *Similar, small ozone benefit from both fuel scenarios*

Emissions (5-State Region)

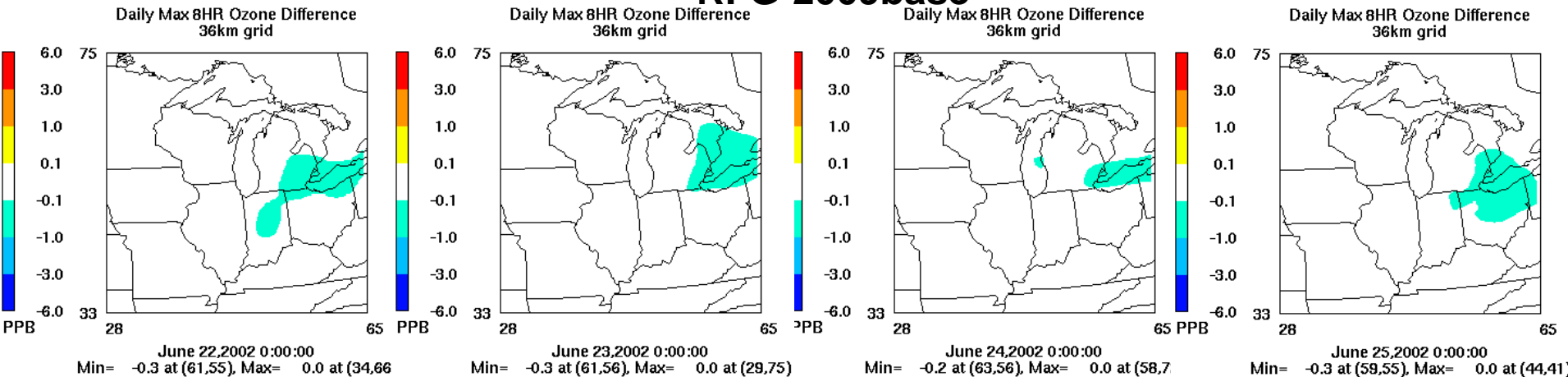


Daily Peak 8 hr O3 Difference Plots for June 22-25, 2002 (no cut-off)

RVP-2009base



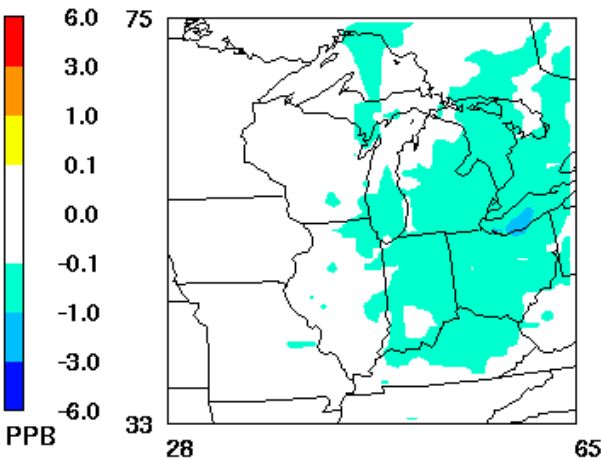
RFG-2009base



Summer 2002 Episode Peak 8 hr Ozone Difference Plots (60 ppb cut-off)

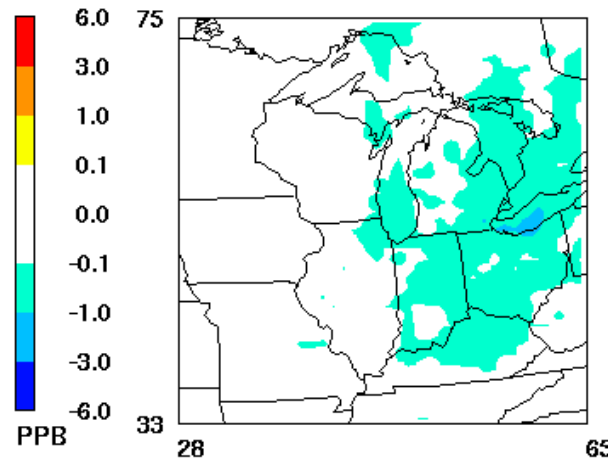
RVP-2009base

Maximum Ozone Difference
36km grid - 60ppb cutoff



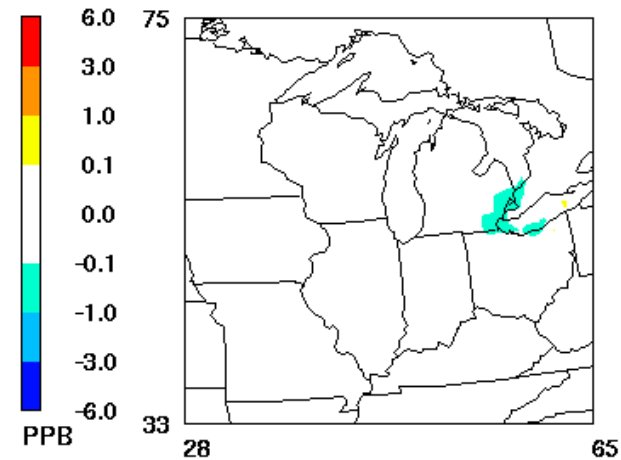
RFG-2009base

Maximum Ozone Difference
36km grid - 60ppb cutoff



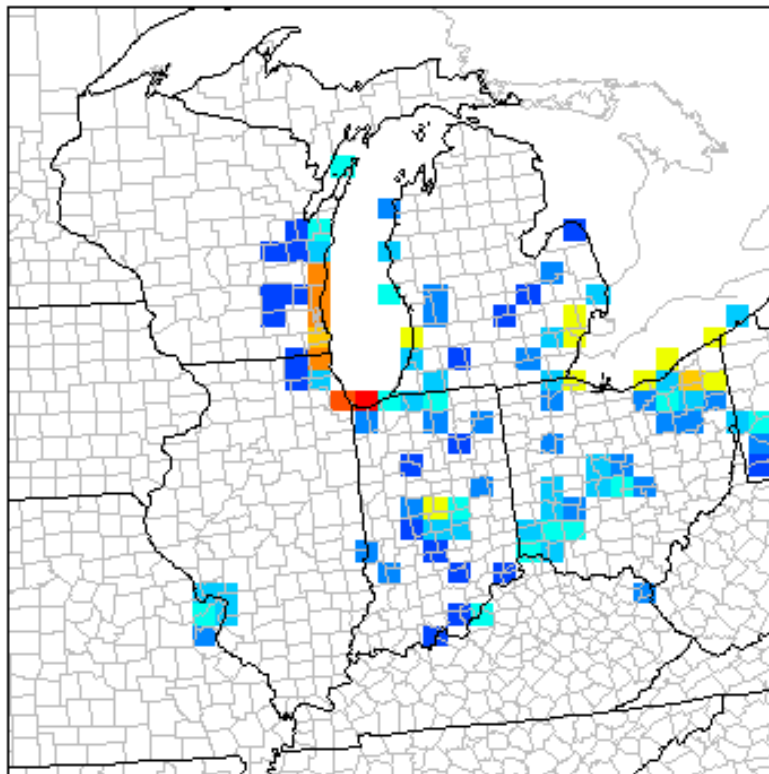
RFG-RVP

Maximum Ozone Difference
36km grid - 60ppb cutoff

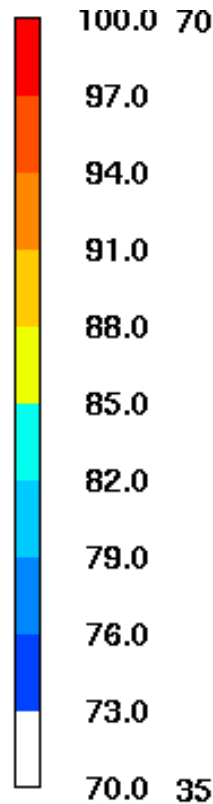
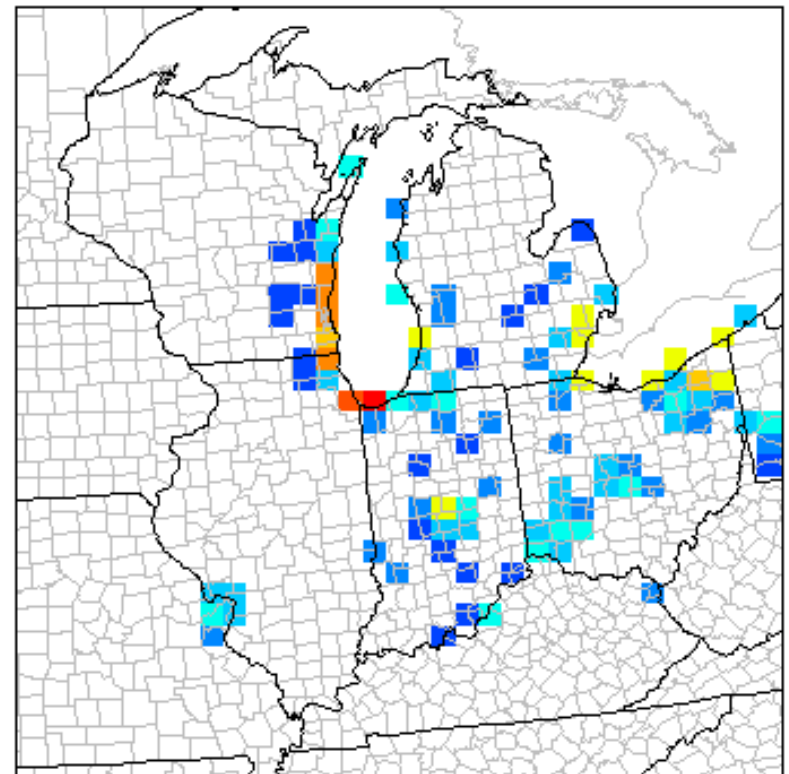


Ozone Attainment Results

RVP



RFG



Summary

- Regional, multi-pollutant planning approach
- SIPs for ozone (8-hour) and PM_{2.5} due in mid-2007 and early 2008, respectively
 - Need to identify control strategies by late 2005/early 2006
- Modeling shows “on the books” and “on the way” controls will improve air quality, but there will not be enough to provide for attainment everywhere
- Examination of additional, candidate control measures is on-going