

New SIP Modeling

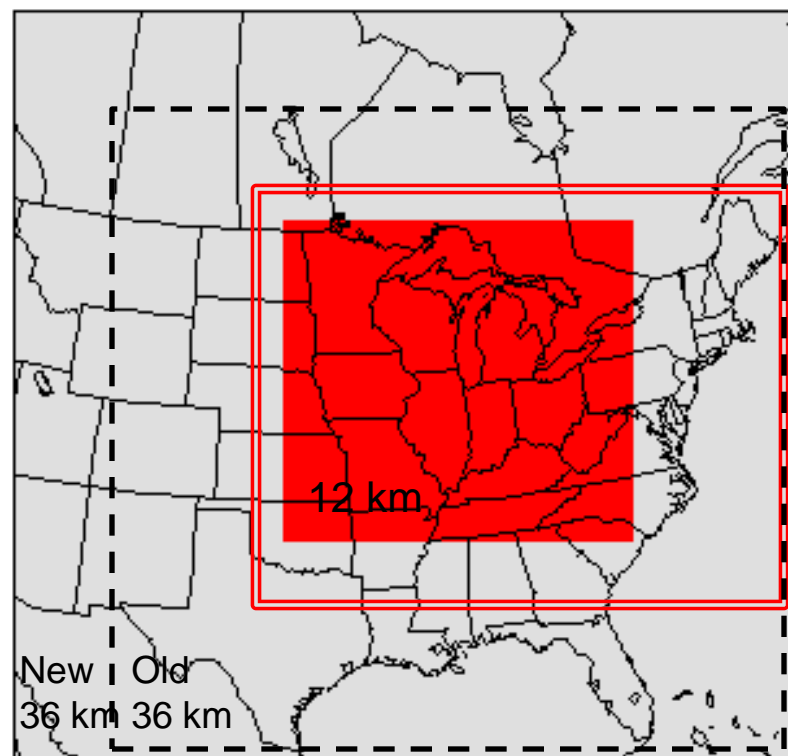
Model: CAMx (and CMAQ?)

Domain/Grid: U.S./Canada
(36 km), Midwest (12 km),
Lake Mich/Det/Clev (4 km)

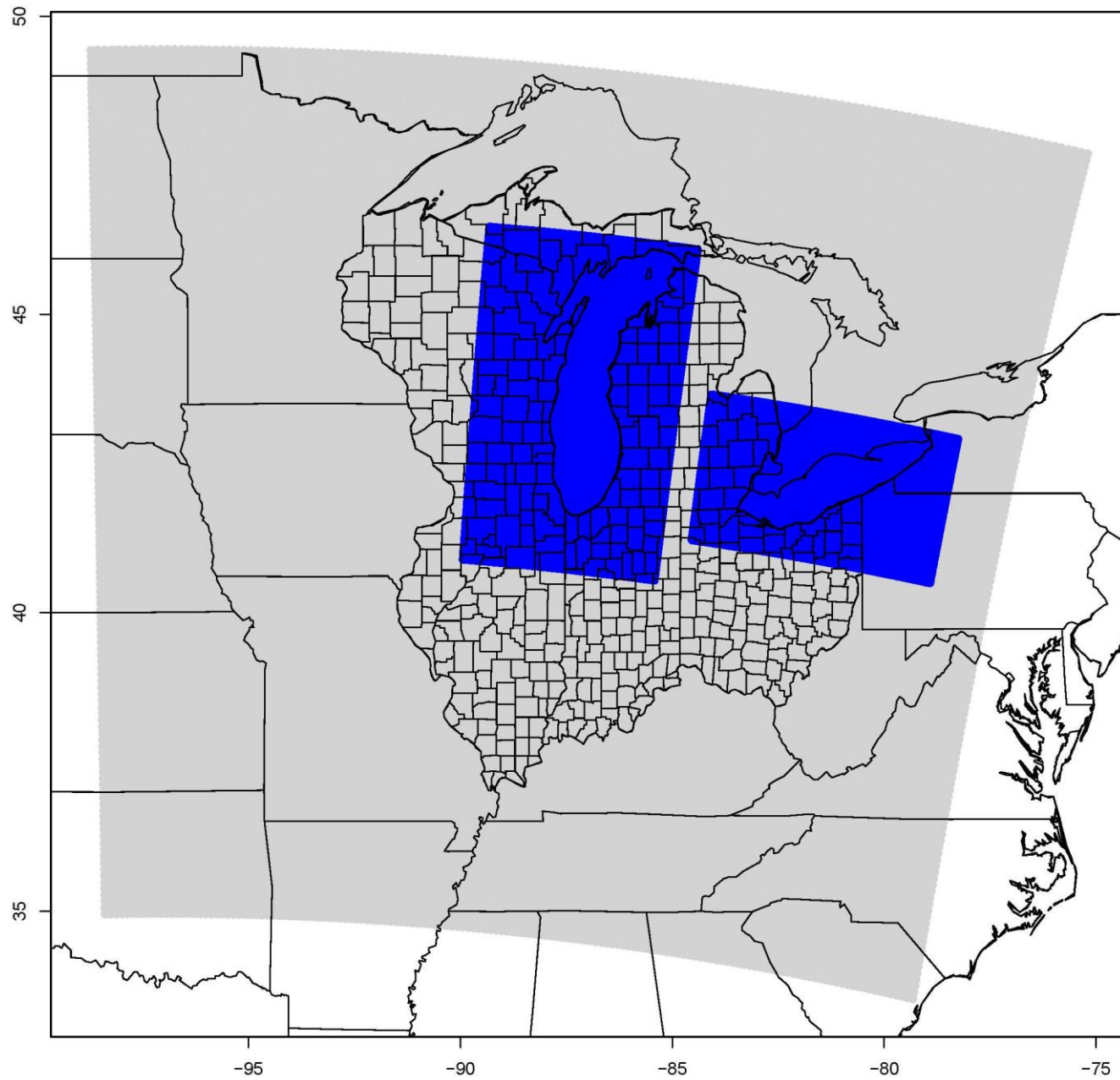
Meteorology: 2007, 2008

Base Year: 2007, 2008?

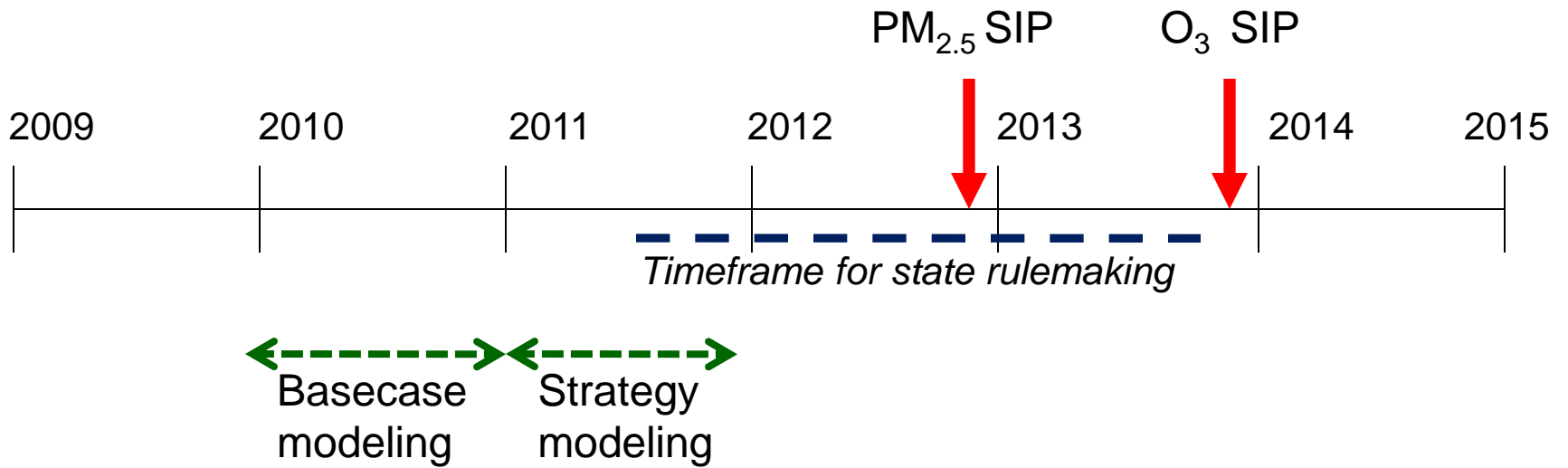
Future Years: TBD (3 years)



Revised proposed 4 km grids over Lake Michigan and Lake Erie



Schedule

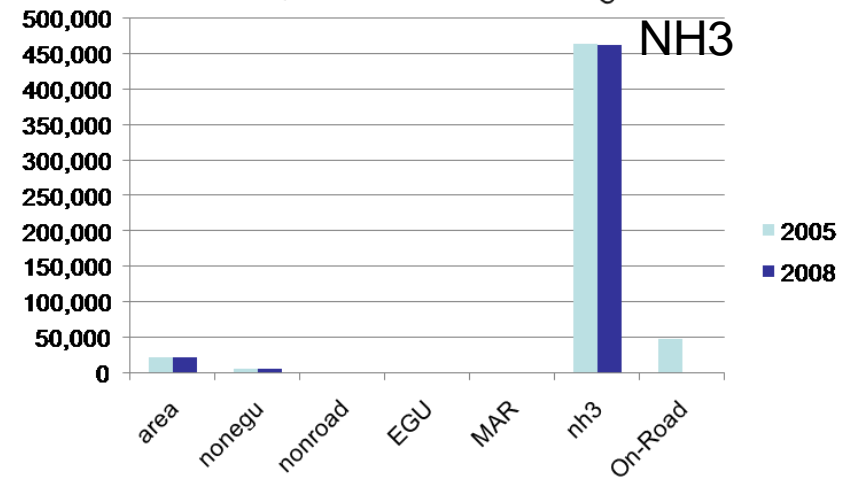
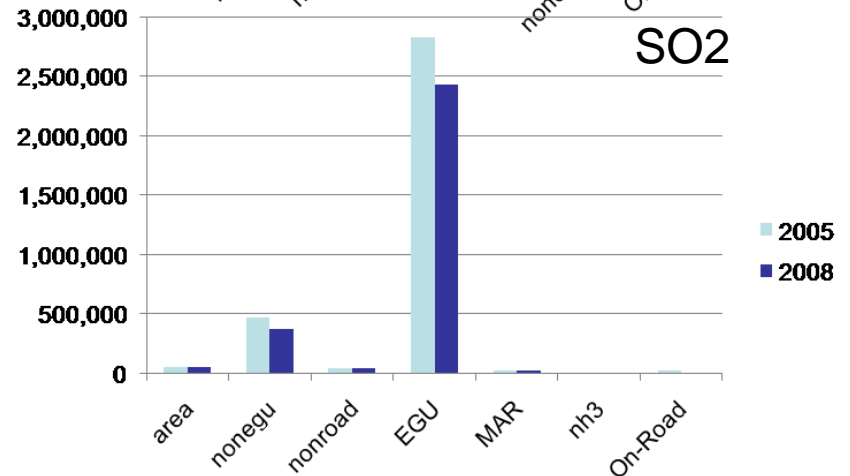
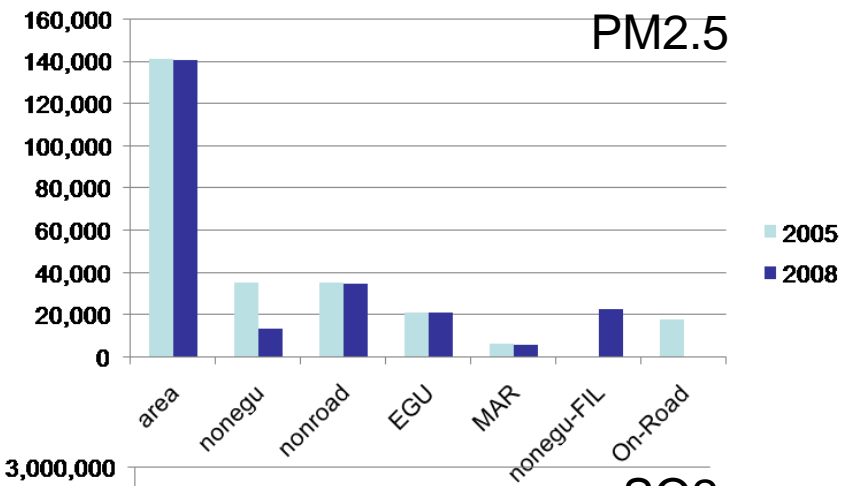
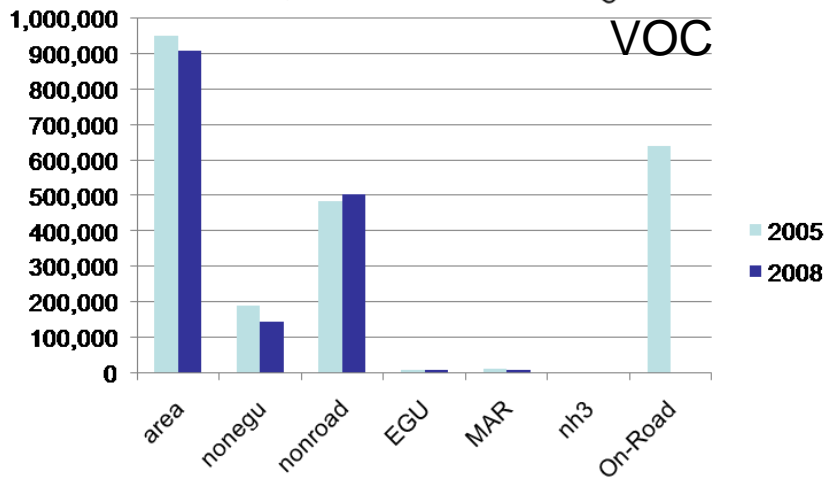
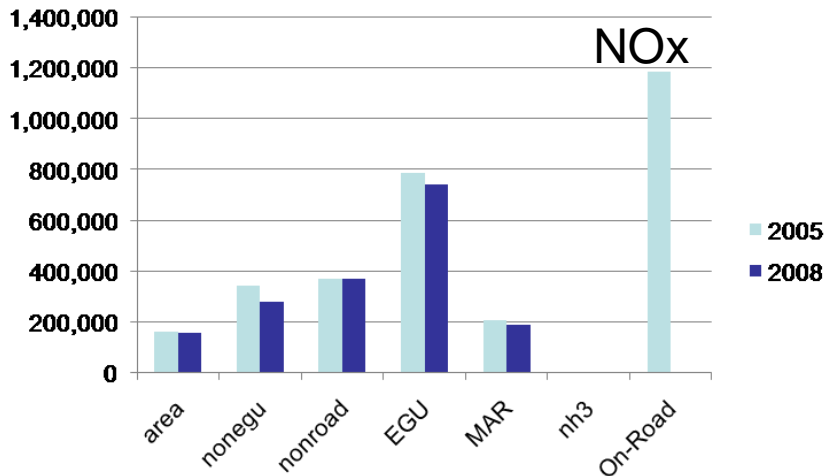


Modeling Overview

	1997 NAAQS	'06/'08('10) NAAQS
Model	MM5/EMS/CAMx	MM5(WRF?)/CONCEPT/CAMx
Baseyear	2002, 2005	2007 or 2008 ??
Met years	2002, 2005	2007, 2008
Future years	2009, 2012, 2018	2013, 2017, 2020 ?? (OTC) 2014, 2020, 2026 ?? 2015, 2020, 2025 ??
Domain	Eastern U.S.	Eastern U.S. (expanded)
Grid Spacing	36 km PM _{2.5} /haze 12 km O ₃	36 /12 km PM _{2.5} /haze 12/4 km O ₃
Boundary Cond	GEOS-CHEM (2002) <i>- D. Jacob, 2005</i>	GEOS-CHEM (2007) <i>- GA EPD, 2010</i>

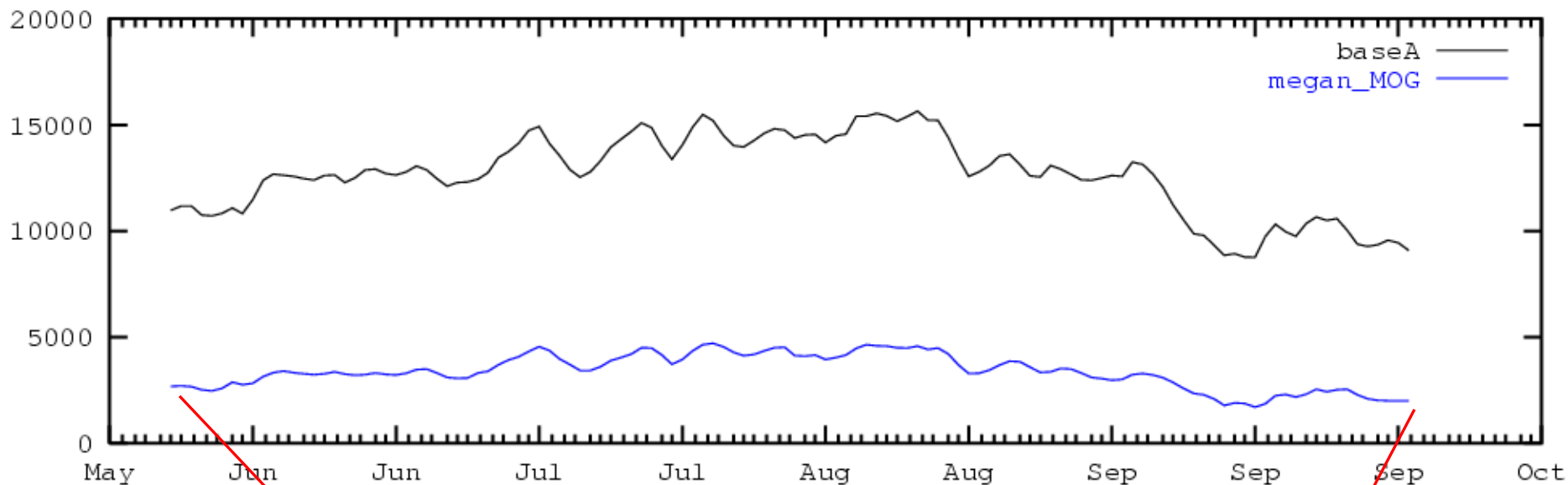
Sector	Base A	Base B	Base C
<i>Delivery Date</i>	<i>January 2010</i>	<i>July 2010 (B+ in August 2010)</i>	<i>October 2010</i>
EGU Point	2007 CEM data (annualized w/ 2005-2007 temporal)	2007 CEM data (annualized w/ 2005-2007 temporal)	2007 CEM data (annualized w/ updated temporal) (updated EGU-nonEGU splitting)
Non-EGU Point	Base M (new grid)	2008 State data	2008 State data (updated EGU-nonEGU splitting)
Area	Base M (new grid)	2008 State data	2008 State data
Nonroad	Base M (new grid)	2007 , 2008 NONROAD2008	2007 , 2008 NONROAD2008
MAR	Base M (new grid)	Base M (new grid)	Rail – ERTAC Marine – Base M (w/ growth?) Aircraft – 2008 State date
Agricultural Ammonia	Base M (new grid)	Base M (new grid)	Base M (new grid) or new ammonia emissions model
Biogenics	MEGAN w/ 2007 met (new grid)	MEGAN w/ 2007 met (new grid)	MEGAN w/ 2007 met (new grid)
On-road	Base M (new grid)	Base M (new grid) B+: initial MOVES emissions	MOVES emissions (improved)
Fires	(not included)	(not included) B+: 2007, 2008 data (S.Spak)	2007, 2008 data (S.Spak)
Non-LADCO Region	Base M (new grid)	Base M (new grid)	New 2007 emissions (per State Collaborative) or EPA data

2005 v. 2007/2008 Emissions

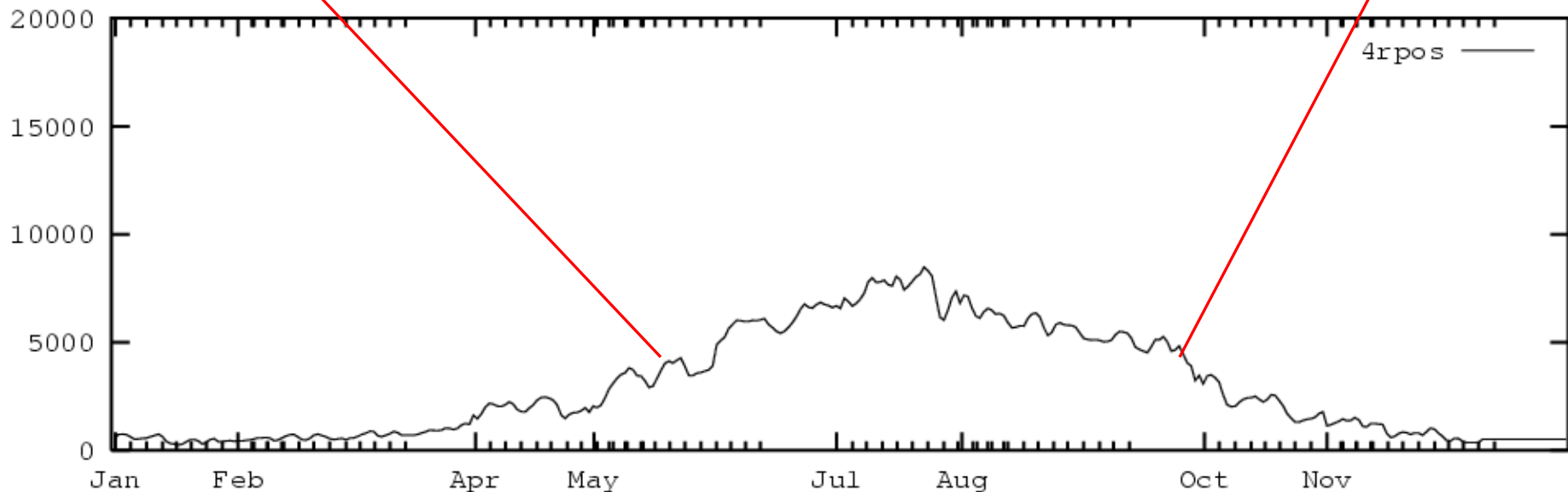


Biogenic Emissions

NOX (TPD) - Emissions - 2007 [LADCO] east36 36

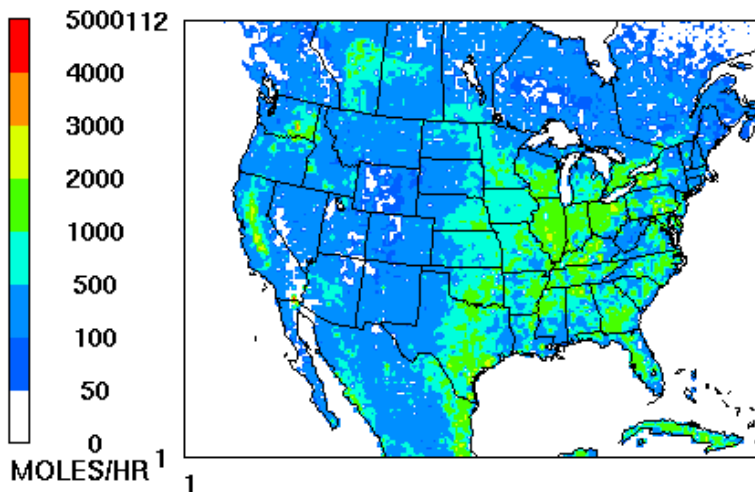


NOX (TPD) - Emissions - 2005 [LADCO] megan_v2proxy 36



NO : mog_megan

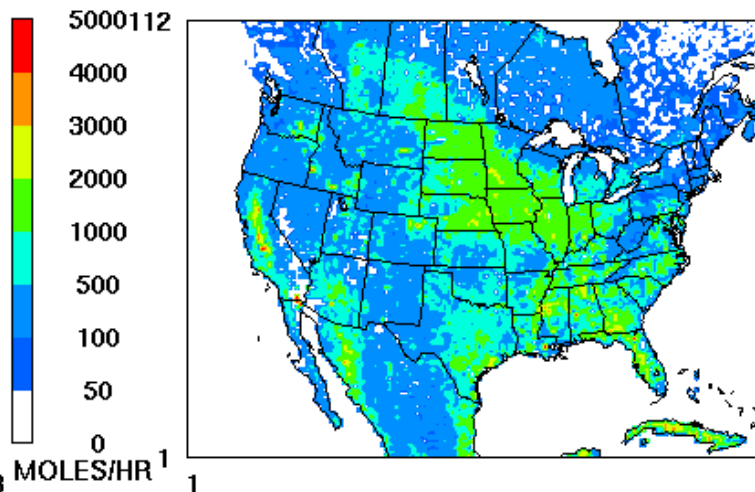
natl 36km 2007152
Abby Fontaine - LADCO



June 1,2007 0:00:00
Min= 0 at (1,1), Max= 6558 at (29,41)

NO : mog_megan

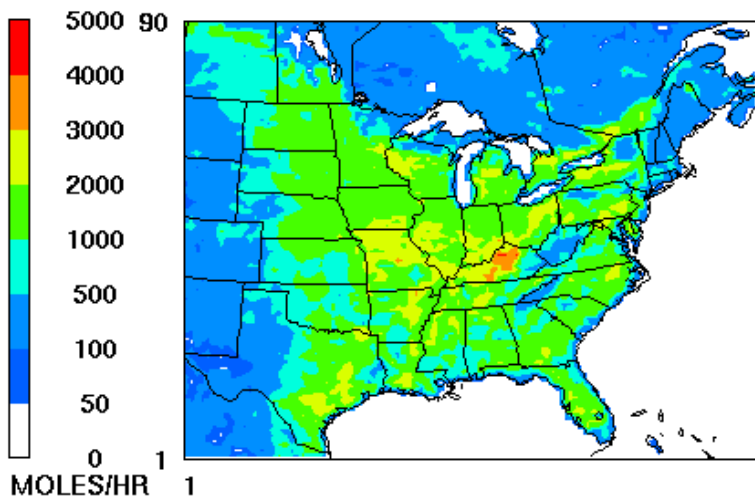
natl 36km 2007182
Abby Fontaine - LADCO



July 1,2007 0:00:00
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NO : megan_v2proxy

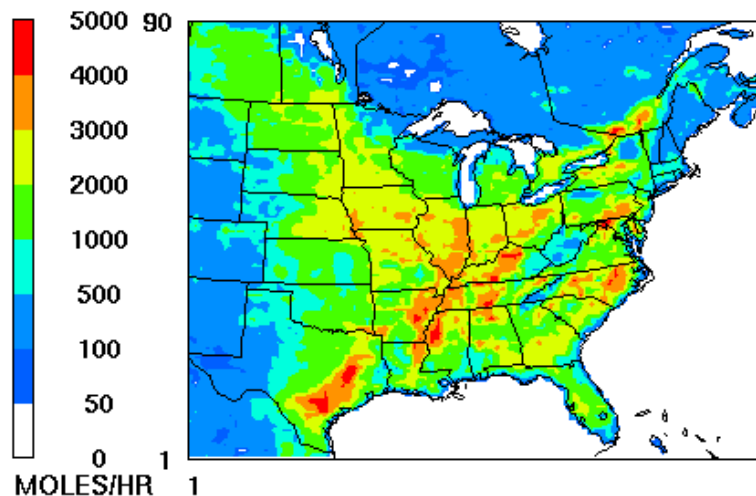
4rpos 36km 20050601
Abby Fontaine - LADCO



June 1,2005 0:00:00
Min= 0 at (26,1), Max= 4035 at (57,42)

NO : megan_v2proxy

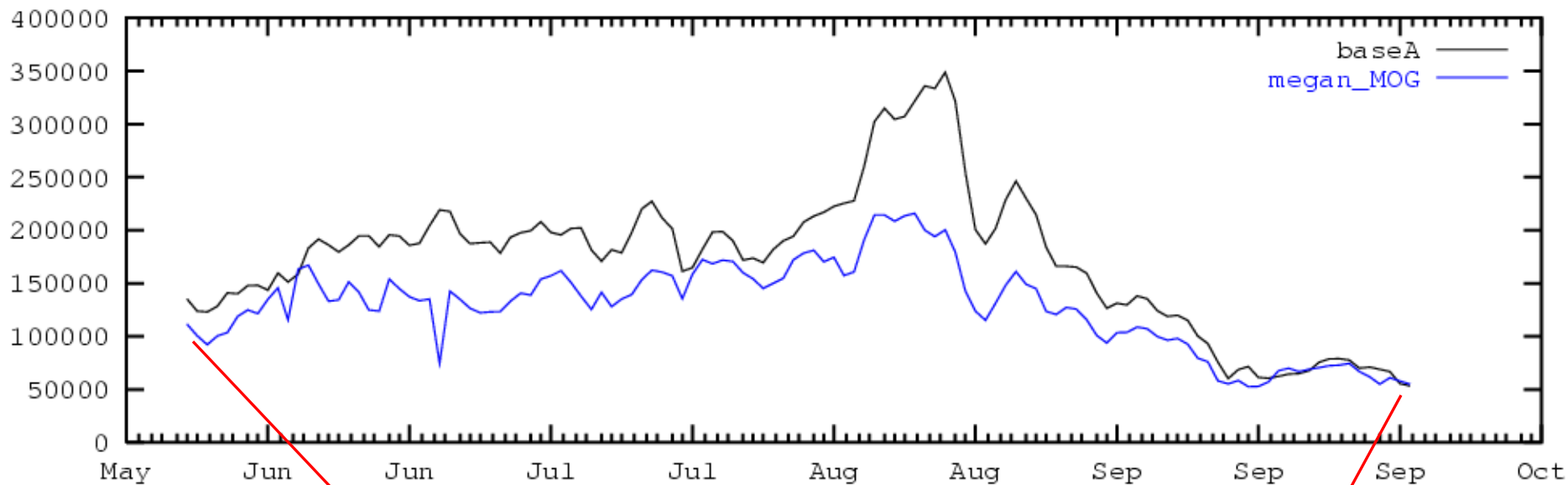
4rpos 36km 20050701
Abby Fontaine - LADCO



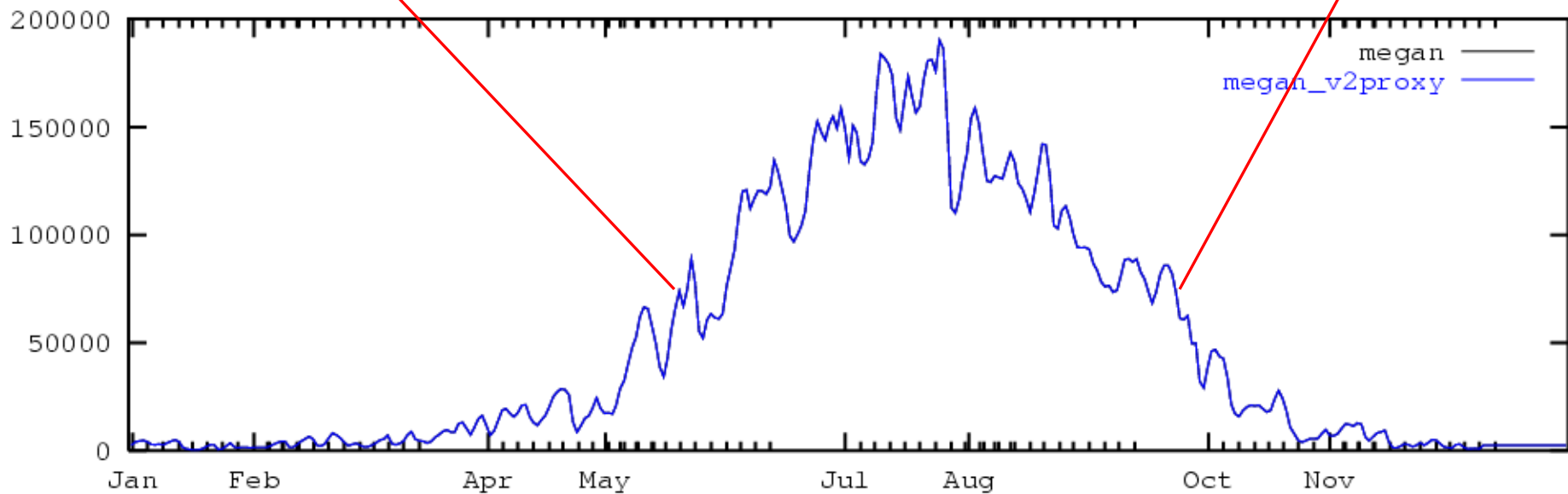
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Min= 0 at (26,1), Max= 4823 at (71,48)

Biogenic Emissions

Isoprene (TPD) - Emissions - 2007 [LADCO] east36 36

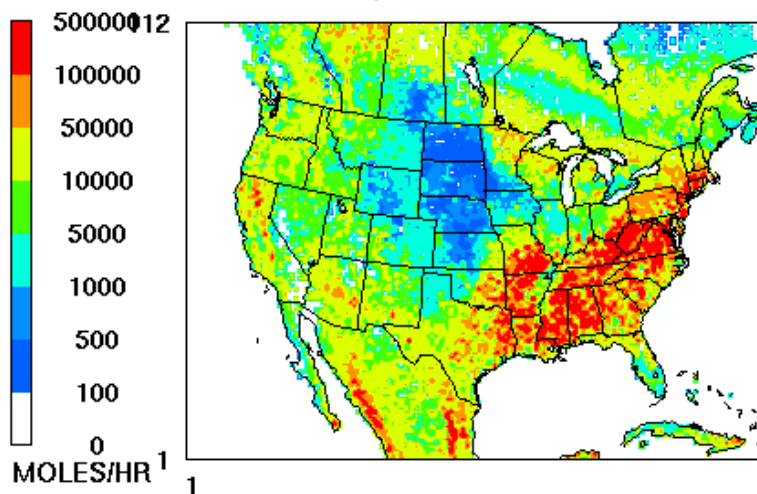


Isoprene (TPD) - Emissions - 2005 [LADCO] 4rpos 36



ISP : mog_megan

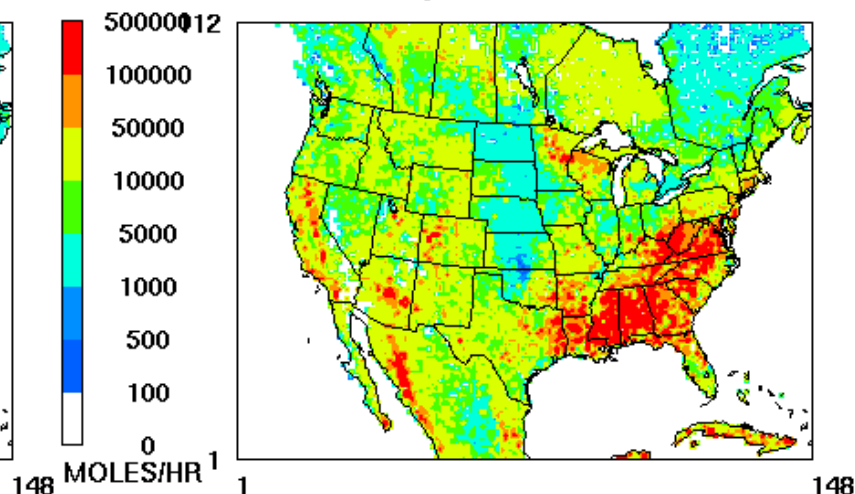
natl 36km 2007152
Abby Fontaine - LADCO



June 1, 2007 0:00:00
Min= 0 at (1,1), Max= 479482 at (70,7)

ISP : mog_megan

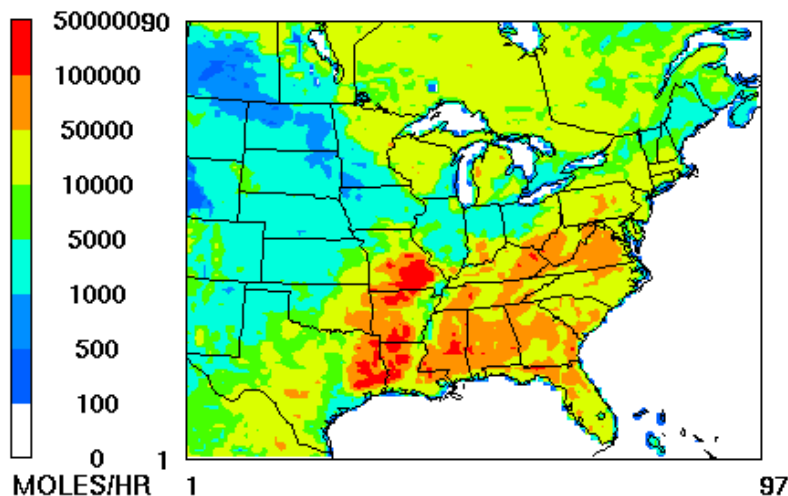
natl 36km 2007182
Abby Fontaine - LADCO



July 1, 2007 0:00:00
Min= 0 at (1,1), Max= 593477 at (103,36)

ISP : megan_v2proxy

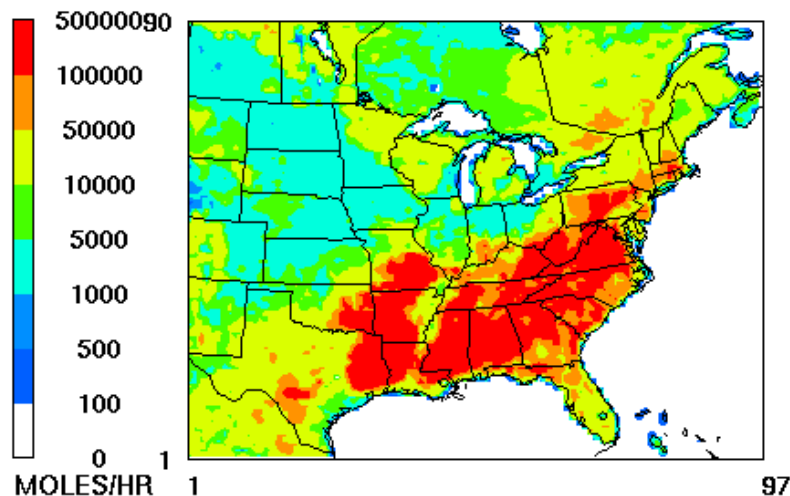
4rpos 36km 20050601
Abby Fontaine - LADCO



June 1, 2005 0:00:00
Min= 0 at (26,1), Max= 217746 at (40,36)

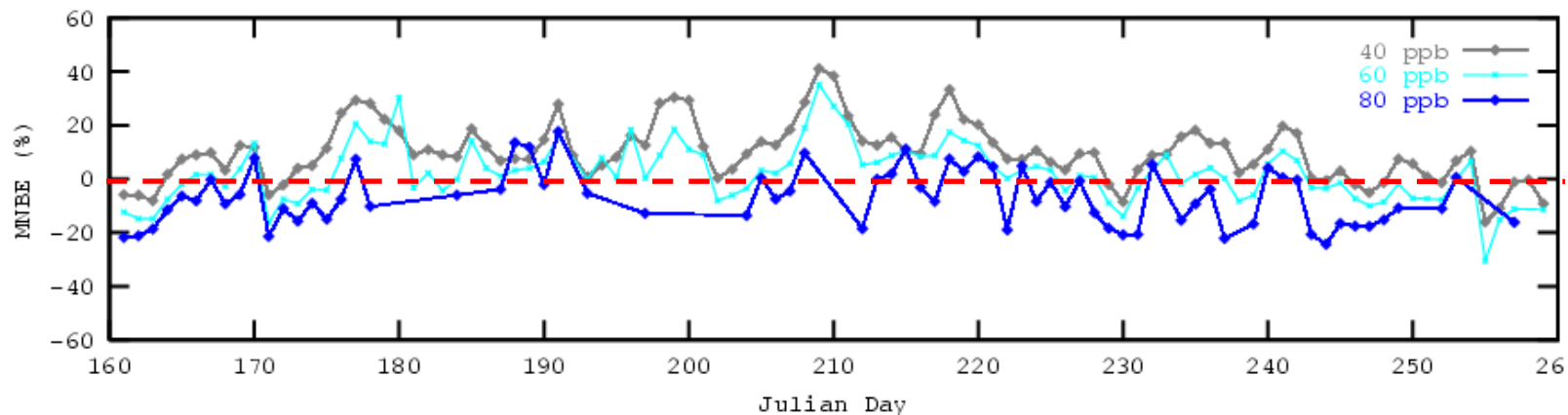
ISP : megan_v2proxy

4rpos 36km 20050701
Abby Fontaine - LADCO

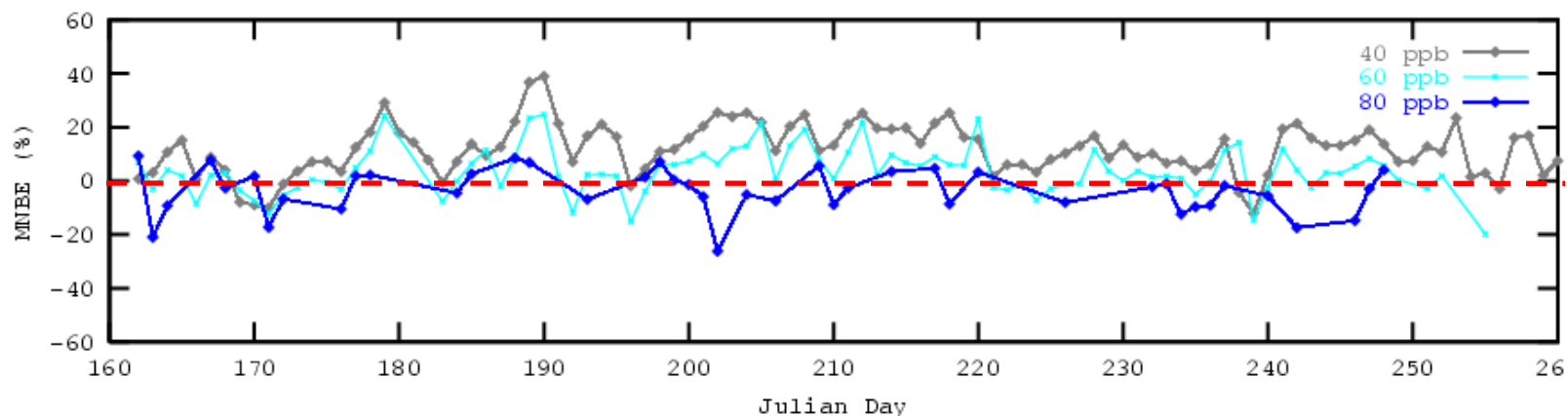


July 1, 2005 0:00:00
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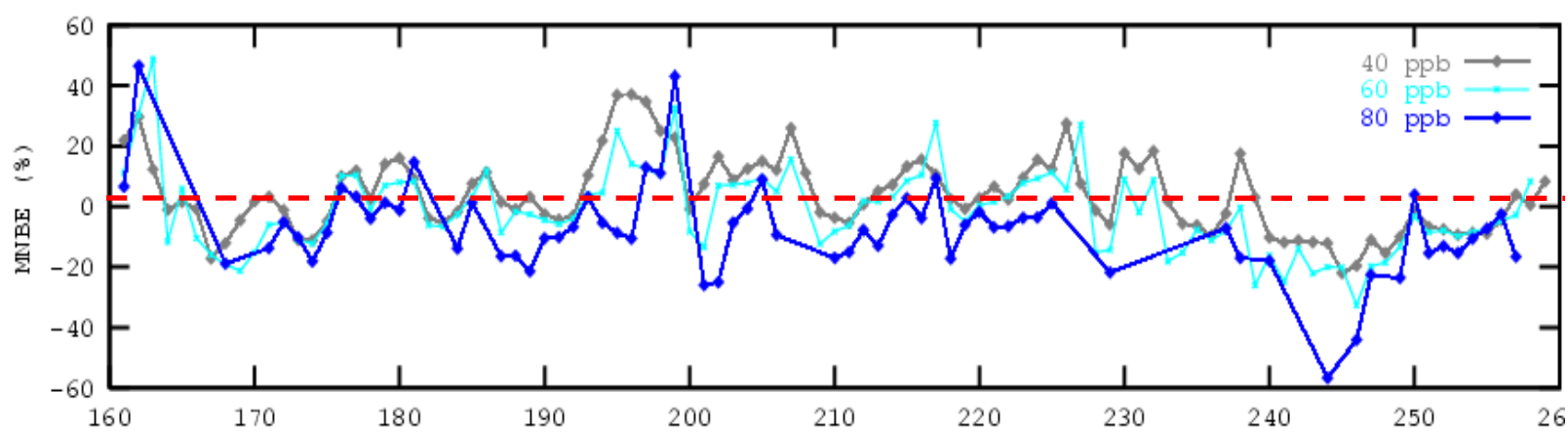
8 HR O3 (ppb) - 2007 - baseA_MOGbiog12_07summer [LADCO] camx



8 HR O3 (ppb) - 2008 - baseA_MOGbiog12_08summer [LADCO] camx



8 HR O3 (ppb) - 2005 - baseM3_05summer [LADCO] camx



Outstanding Issues

- Photochemical Model
 - CAMx (workhorse) v. CMAQ (select runs?)
- Meteorology
 - MM5 v. WRF
- What is our base year?
 - 2007 or 2008?
- Base case model performance
 - Base A: overestimation of regional ozone , underestimation of OC
- Sensitivity runs
 - Pollutants?, regions?, source sectors?
- Probing tools
 - OSAT/PSAT applications? DDM applications?

Outstanding Issues (cont.)

- Emissions Inventory
 - Biogenics, ammonia, on-road, and PM-filterable/PM-condensable
- Future years of interest
 - OTC: 2013, 2017, 2018
- Growth & control factors
 - EGUs – ERTAC v. IPM
 - Non-EGU point and area – review/update Base M factors?
- Control strategies
 - “On the books/on the way” and ????
- Attainment test
 - LADCO program v. EPA program
 - Role of weight-of-evidence
- Unmonitored area analysis
 - Is LADCO approach sufficient (see Baker, 2005)?

Future Years of Interest

1. What is the attainment date?

	Attainment Date	Planning Date
PM2.5-Annual	April 2010 (April 2015)	2009
PM2.5-Daily	April 2014 (April 2019)	2013
Ozone - 1997	2007, 2010, 2013, ... <i>marginal, moderate, serious, ...</i>	2006, 2009, 2012, ...
Ozone - 2010	2014, 2017, 2020, ... <i>marginal, moderate, serious, ...</i>	2013, 2016, 2019, ...

2. What are others modeling?

EPA (Transport Rule)	2012, 2014
OTC	2013, 2017, 2020