



Interim LADCO Modeling of EPA's 2011ed platform

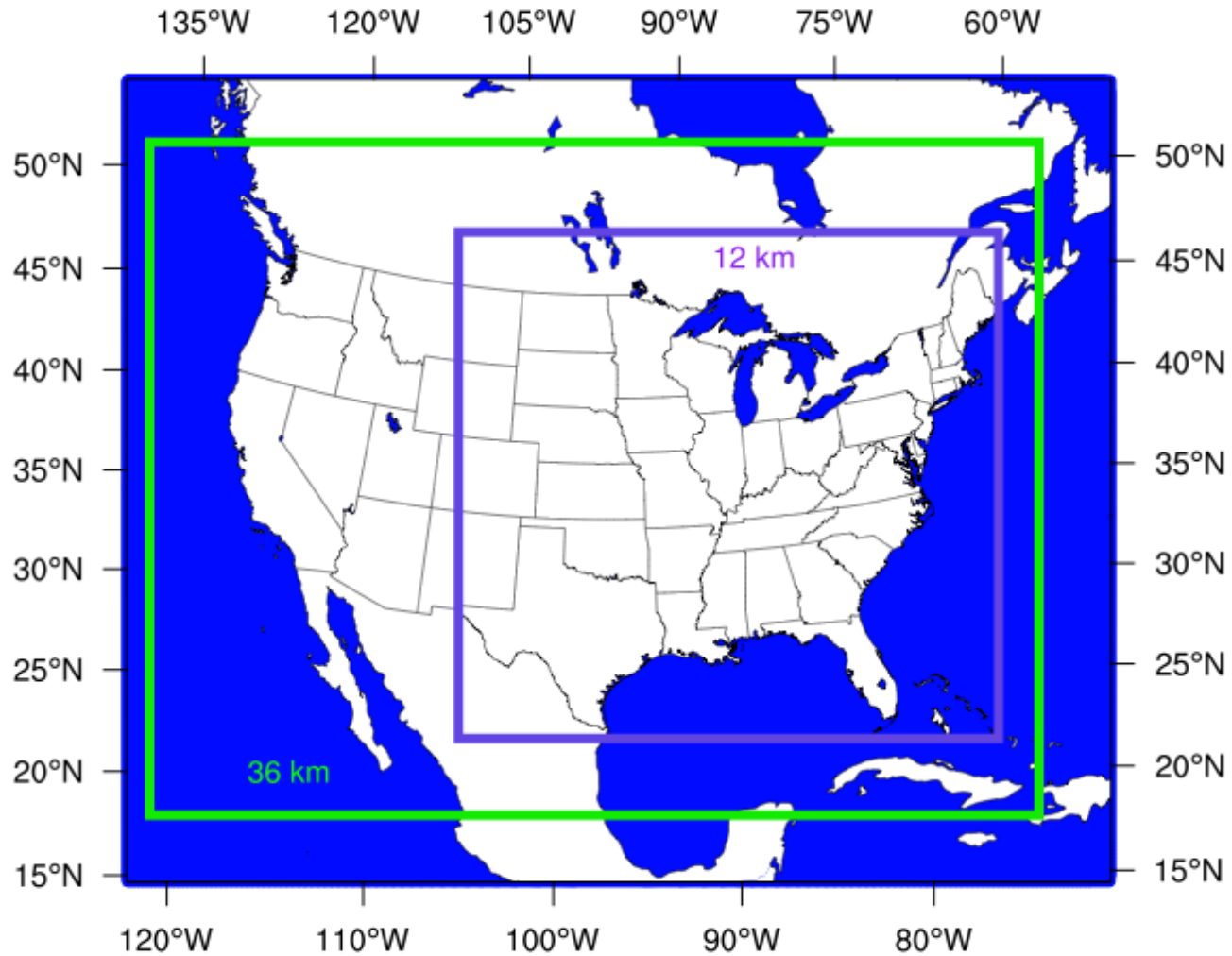
Alexander Cohan

Photochemical Modeler

Acknowledgements

- EPA OAQPS
 - Alison Eyth
 - Kirk Baker
 - Norm Possiel
 - Chris Misenis
- IL EPA
 - Scott Leopold

Domain



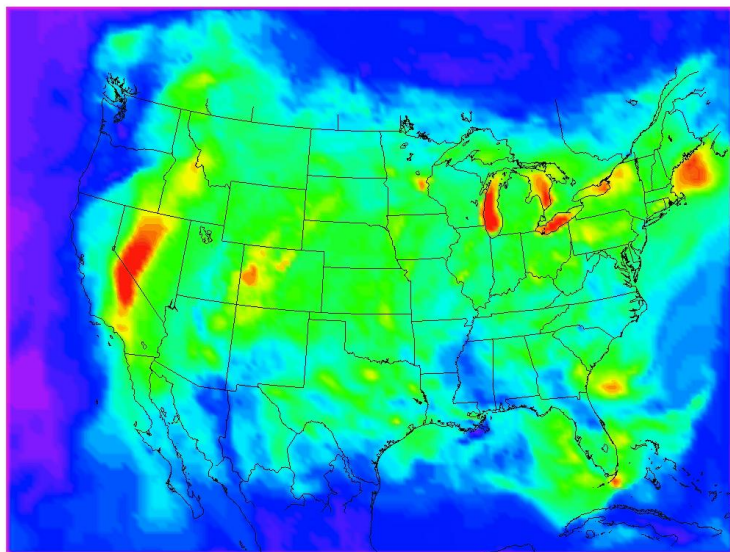
Technical Details

- Meteorology:
 - EPA 2011 version II
- Emissions:
 - EPA 2011 version I
 - Supplemental Canada and Mexico emissions from 2008 NEI
- Model:
 - CAMx V6.00
 - CB5 with CF aero
 - YSU vertical diffusivity with minimum urban KV
- Modeling Period:
 - June 17 to September 26, 2011 with an additional 15 days of spinup

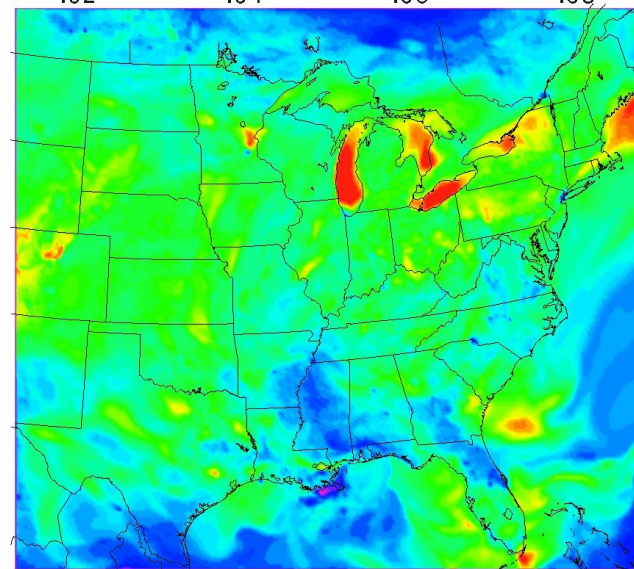
Episode: July 18 – July 23, 2011

36 KM Domain

12 KM Domain



07/17/11 18:00

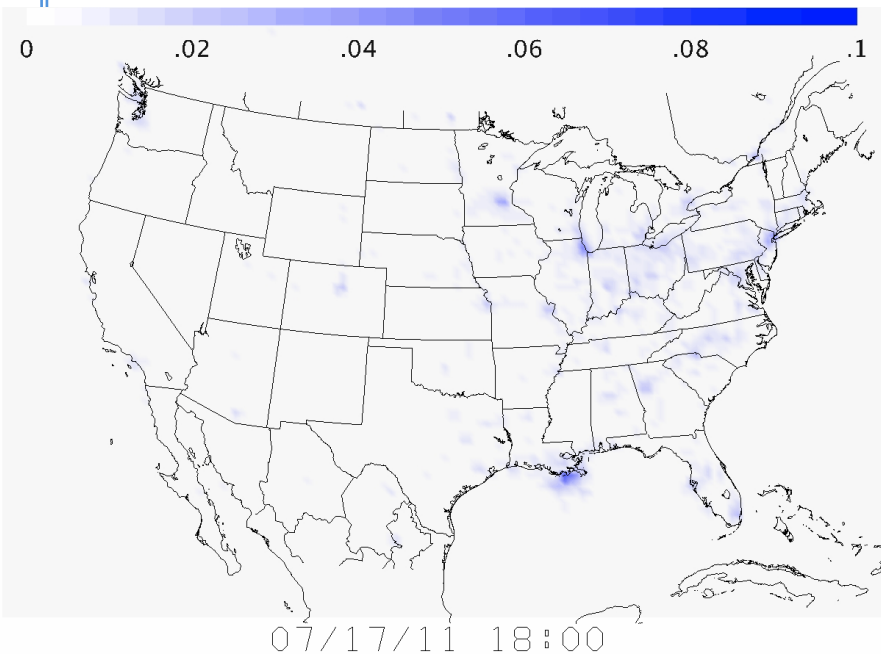


07/17/11 18:00

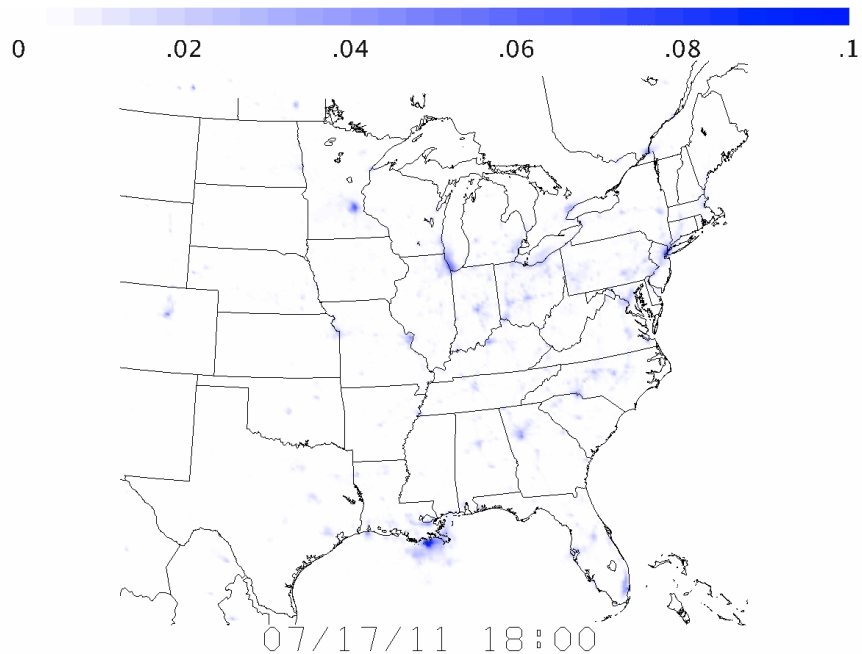
O₃ (PPM)

Episode: July 18 – July 23, 2011

36 KM Domain



12 KM Domain

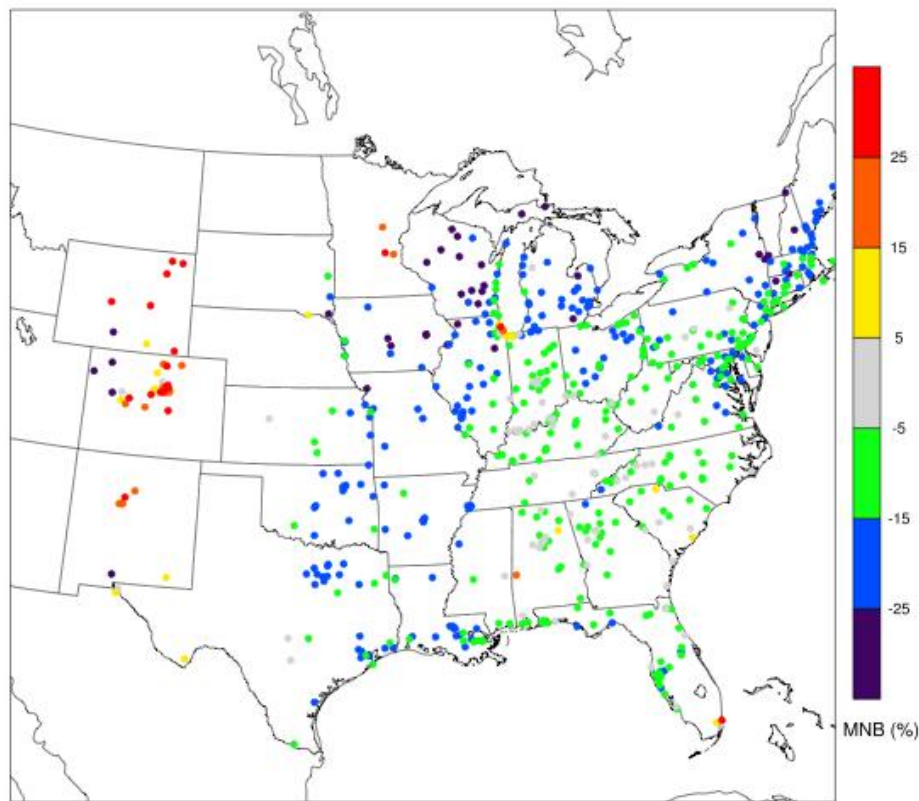


NO_x (PPM)

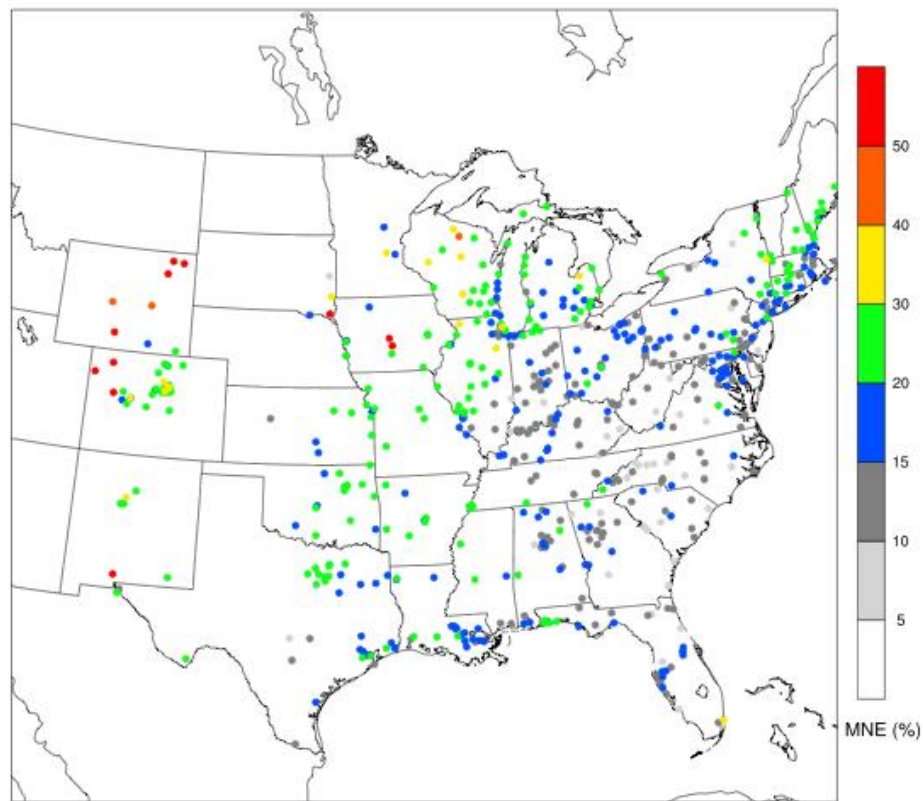
Ozone Evaluation with AQS data

Bias & Error: 60 PPB O₃ Threshold

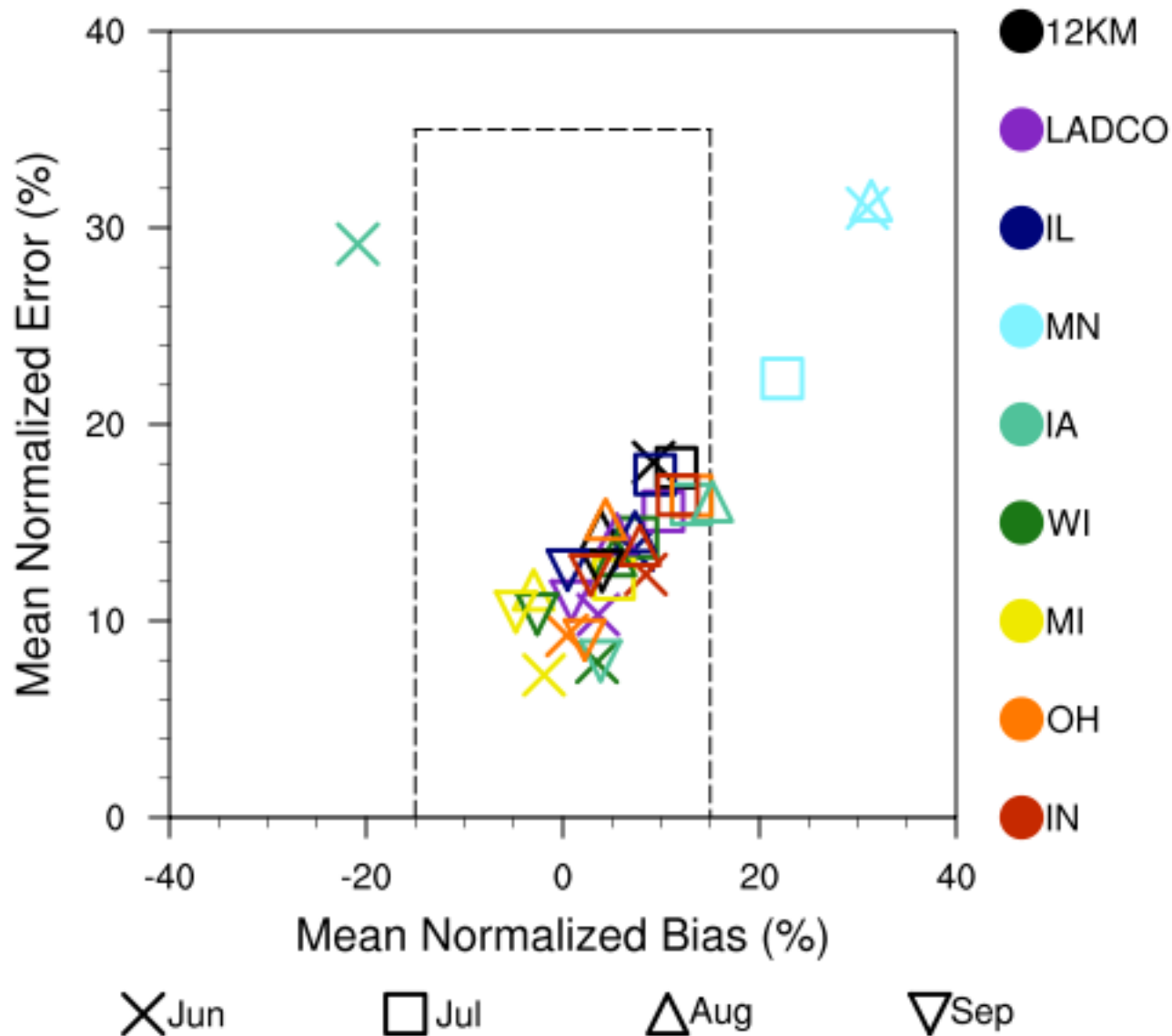
EPA2011A_YSU1_11 O₃ 8HR 60 PPB Threshold BIAS



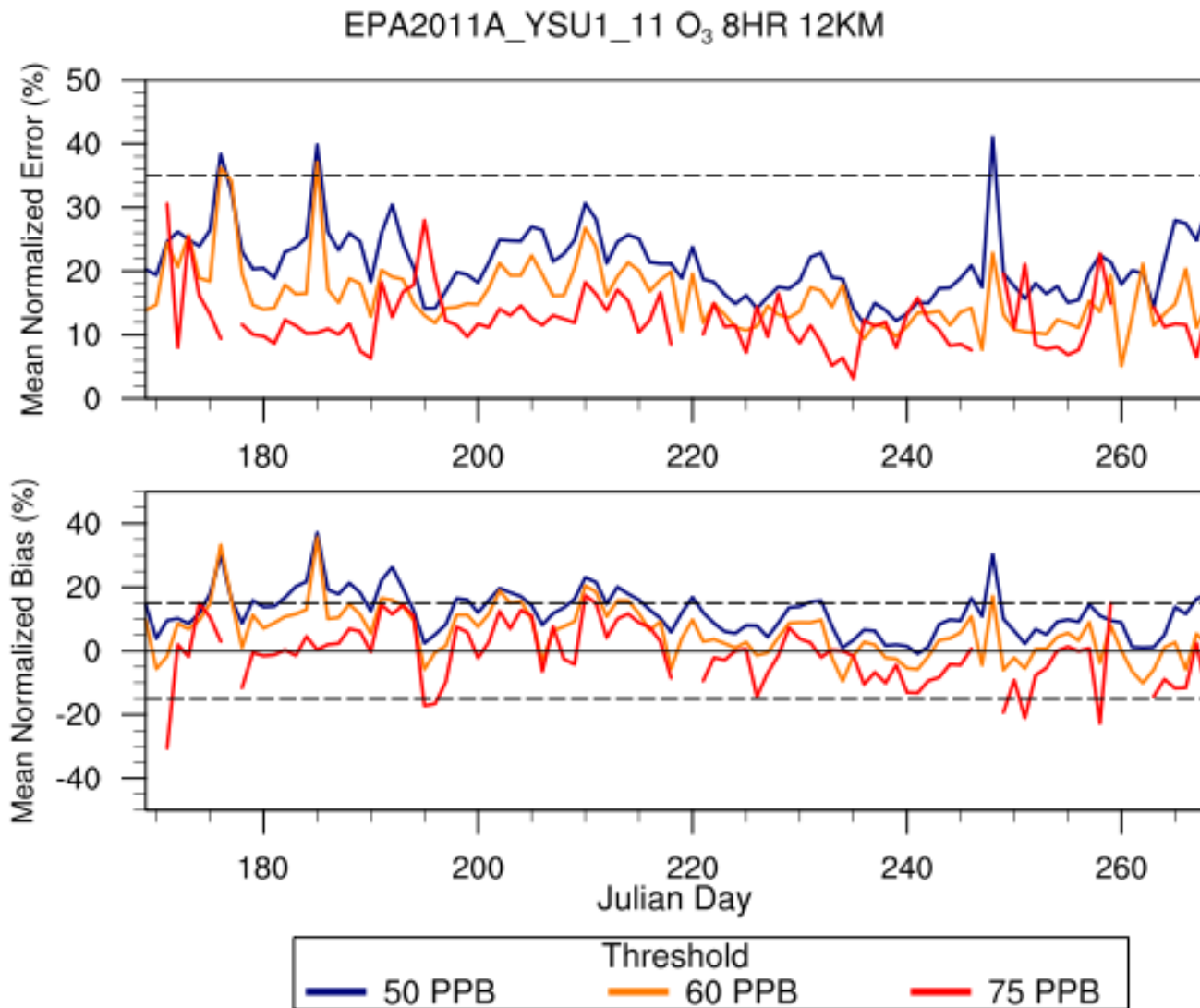
EPA2011A_YSU1_11 O₃ 8HR 60 PPB Threshold ERROR



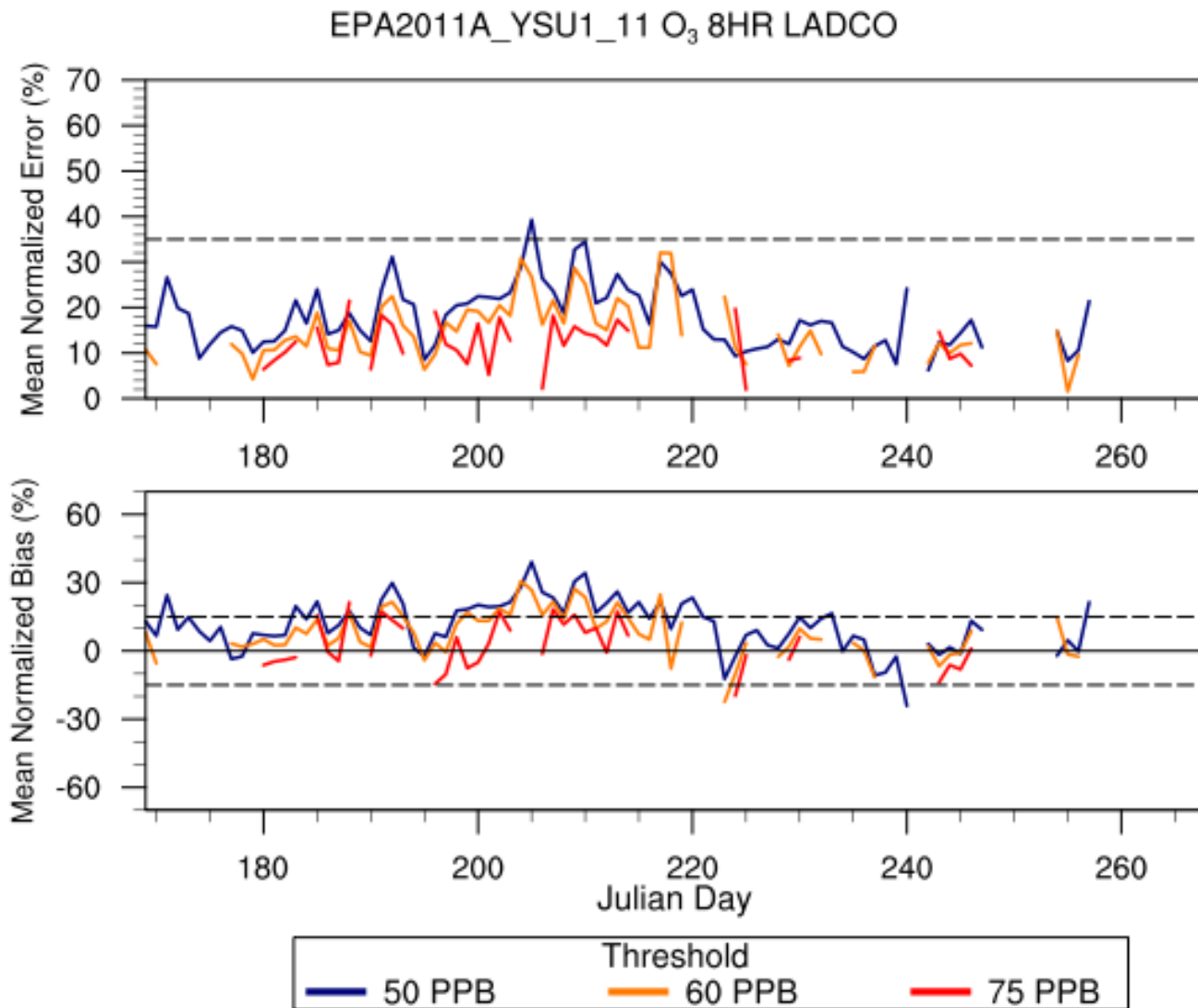
8HR O₃ at 60 PPB Threshold



12KM Domain 8HR O₃ Statistics

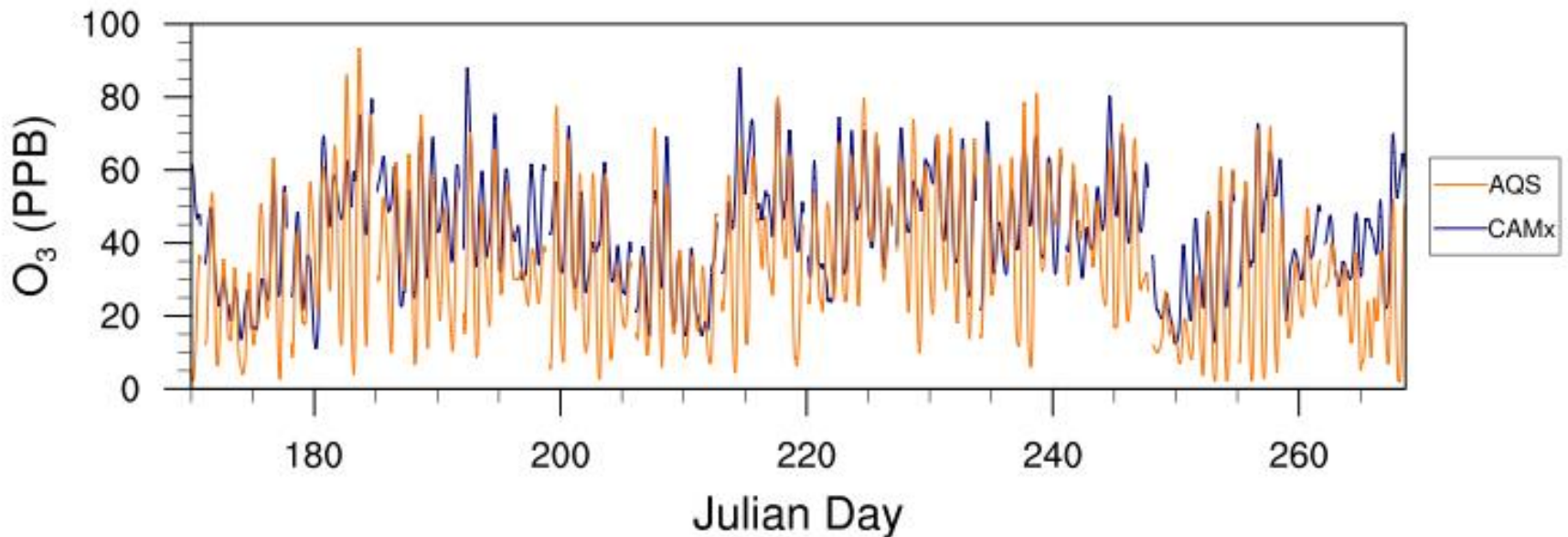


LADCO States 8HR O₃ Statistics



Atlanta, GA

O₃ 8HR Atlanta, GA

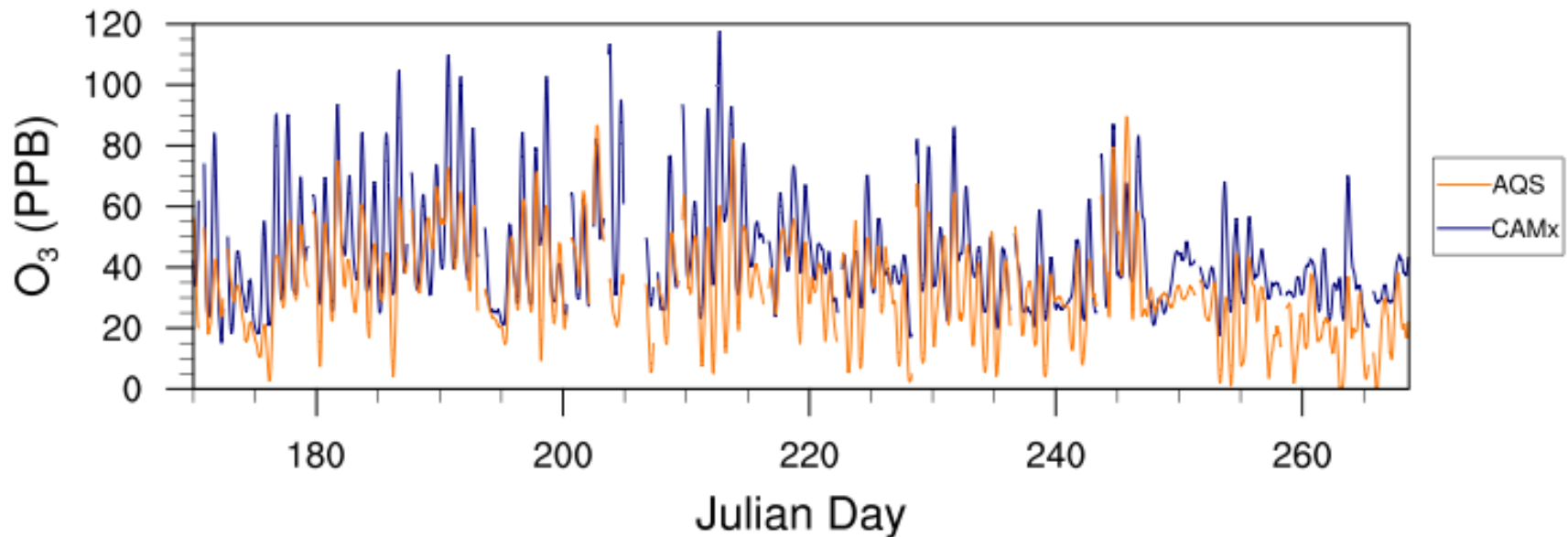


NO THRESHOLD ERROR: 87.09% , BIAS: 80.09%
60 PPB THRESHOLD ERROR: 11.59% , BIAS: -3.68%

Monitor ID 131210055

Chicago, IL

O₃ 8HR Chicago, IL

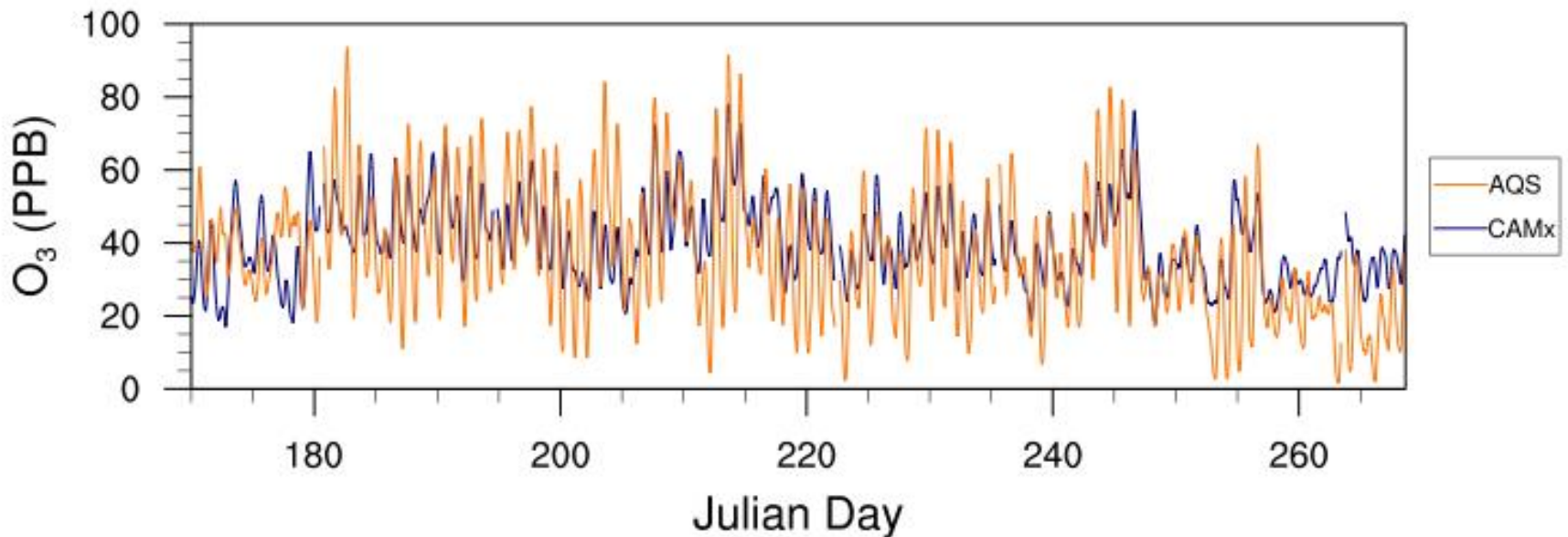


NO THRESHOLD ERROR: 107.54% , BIAS: 102.59%
60 PPB THRESHOLD ERROR: 25.07% , BIAS: 13.78%

Monitor ID 170310037

St. Louis, MO

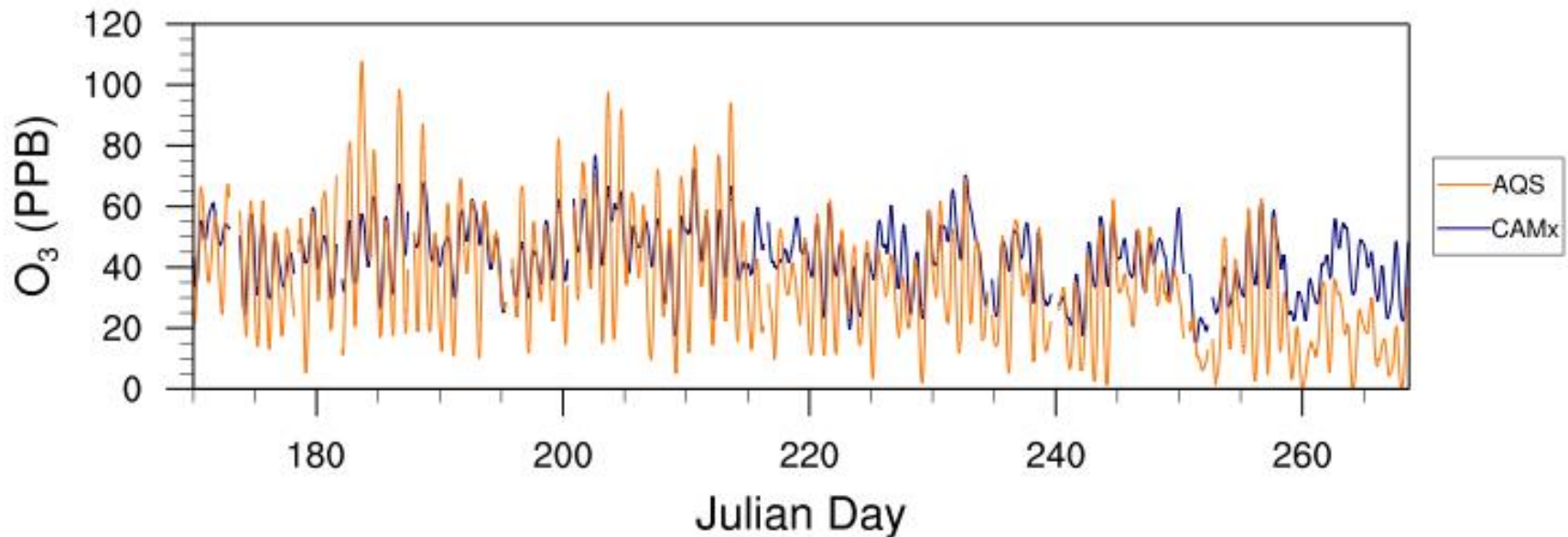
O₃ 8HR St. Louis, MO



NO THRESHOLD ERROR: 64.68% , BIAS: 53.25%
60 PPB THRESHOLD ERROR: 20.16% , BIAS: -18.53%

Harford, MD

O₃ 8HR Harford, MD



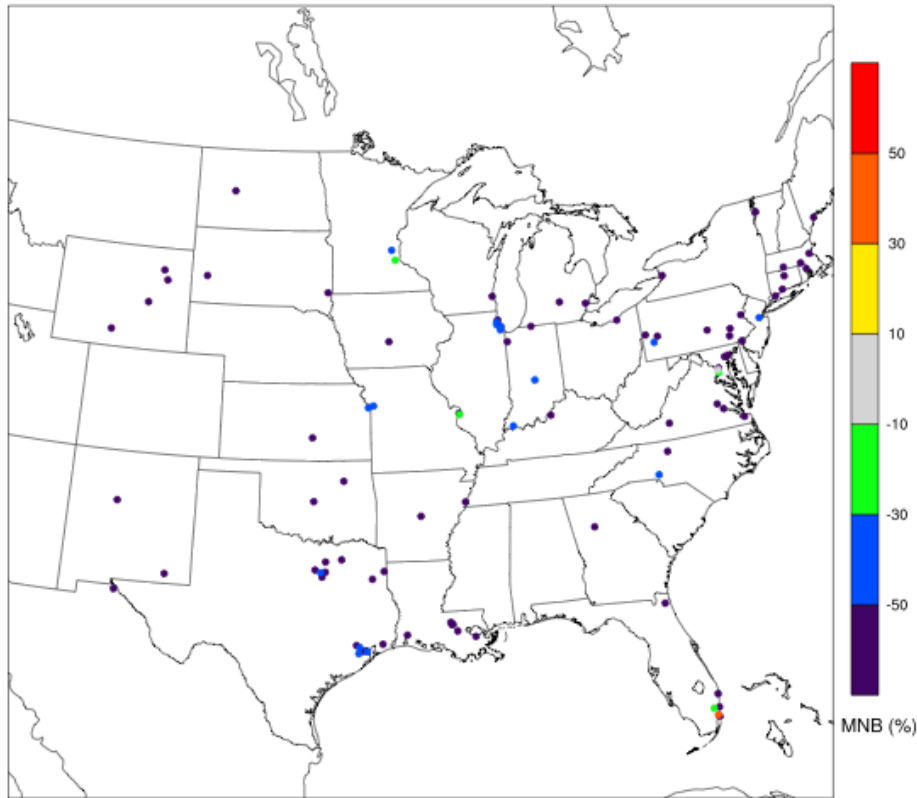
NO THRESHOLD ERROR: 114.21% , BIAS: 107.21%
60 PPB THRESHOLD ERROR: 19.58% , BIAS: -18.55%

Monitor ID 240251001

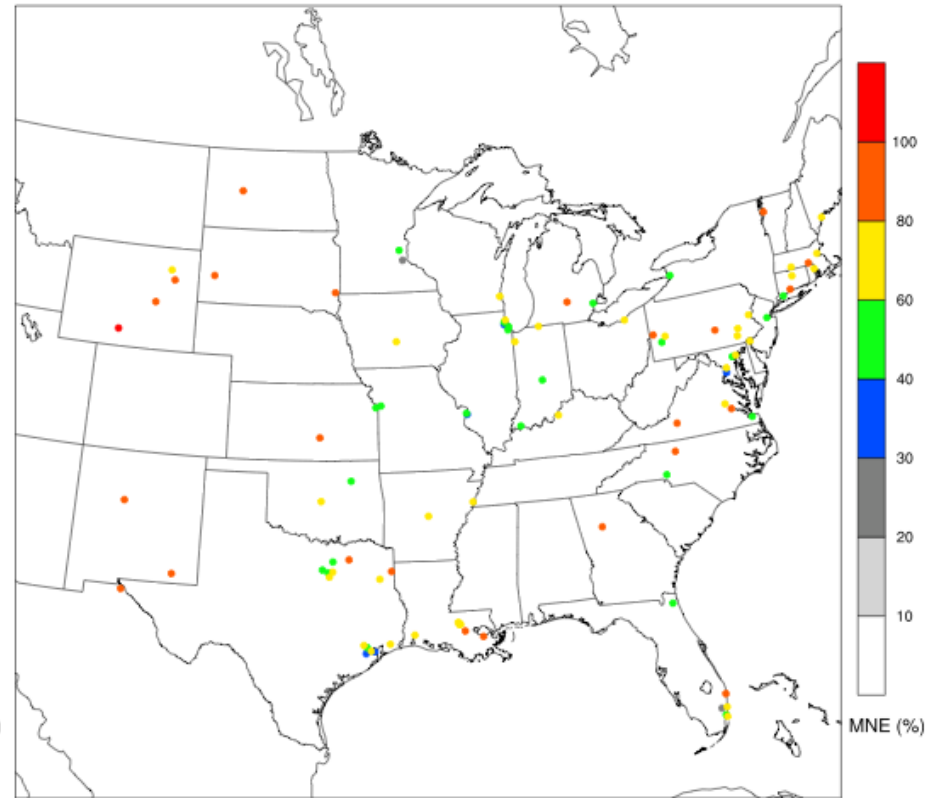
NO_x Evaluation with AQS data

Bias & Error: 60 PPB NO_x Threshold

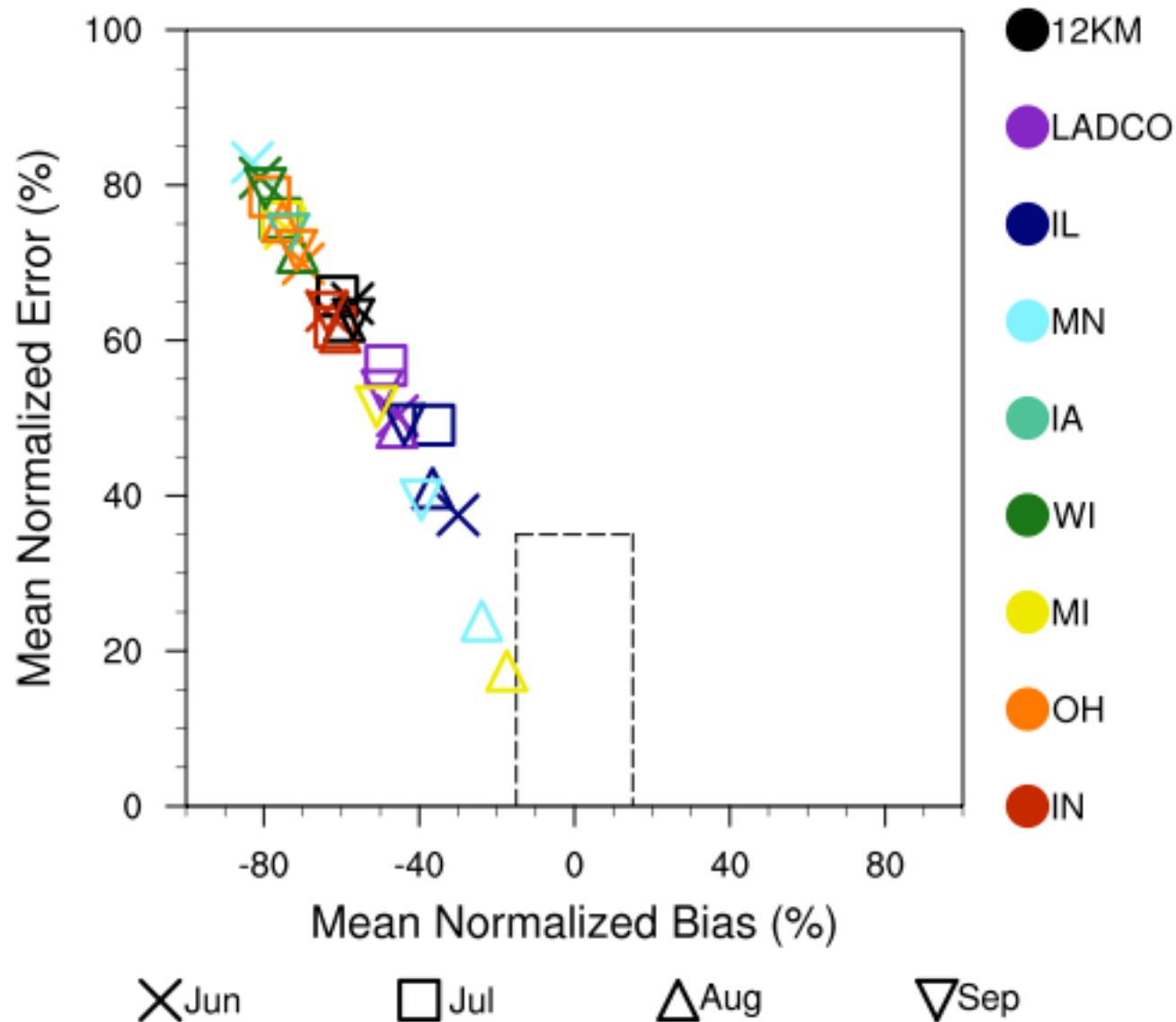
EPA2011A_YSU1_11 NO_x 1HR 60 PPB Threshold BIAS



EPA2011A_YSU1_11 NO_x 1HR 60 PPB Threshold ERROR

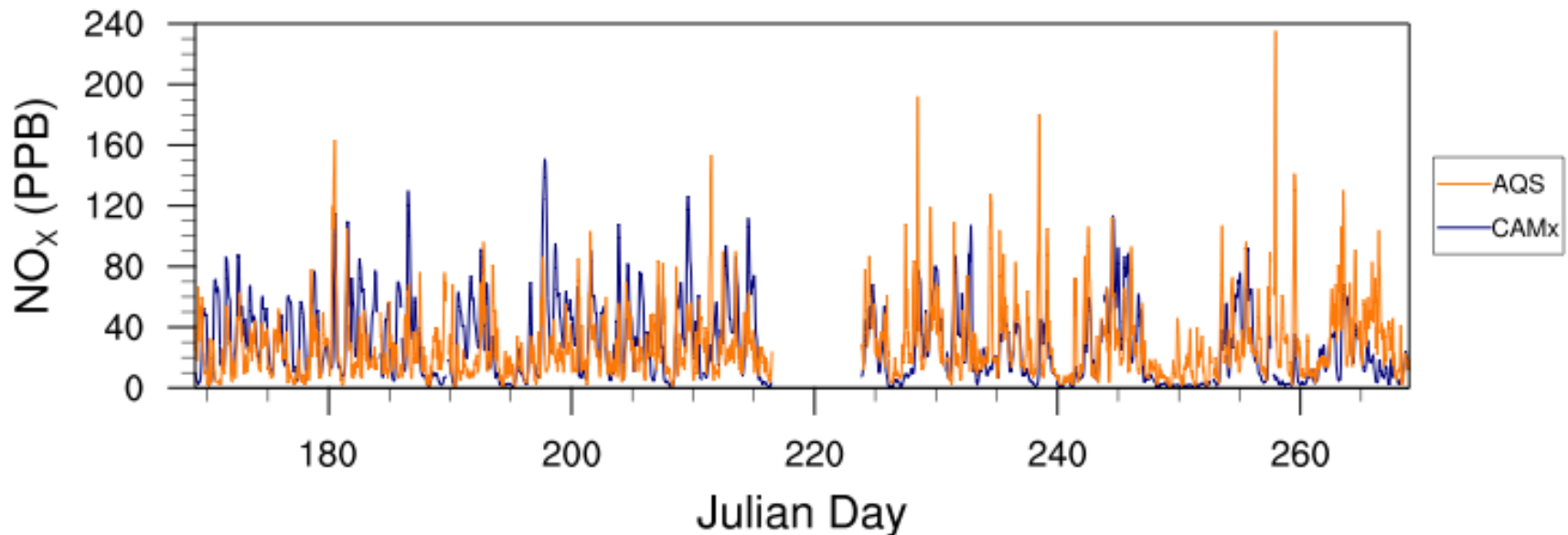


1HR NO_x at 60 PPB Threshold



Chicago, IL

NO_x 1HR Chicago, IL



NO THRESHOLD ERROR: 108.48% , BIAS: 49.93%
60 PPB THRESHOLD ERROR: 58.03% , BIAS: -45.67%

Monitor ID 170310063

Summary

- Ozone error is generally within 35%
- Ozone bias is generally within 15%
 - Some under-prediction in the East and Midwestern
- NO_x performance could be improved
- LADCO is continuing to evaluate model performance

**** Modeling Platform in Development Stage ****

**** PRELIMINARY RESULTS ****

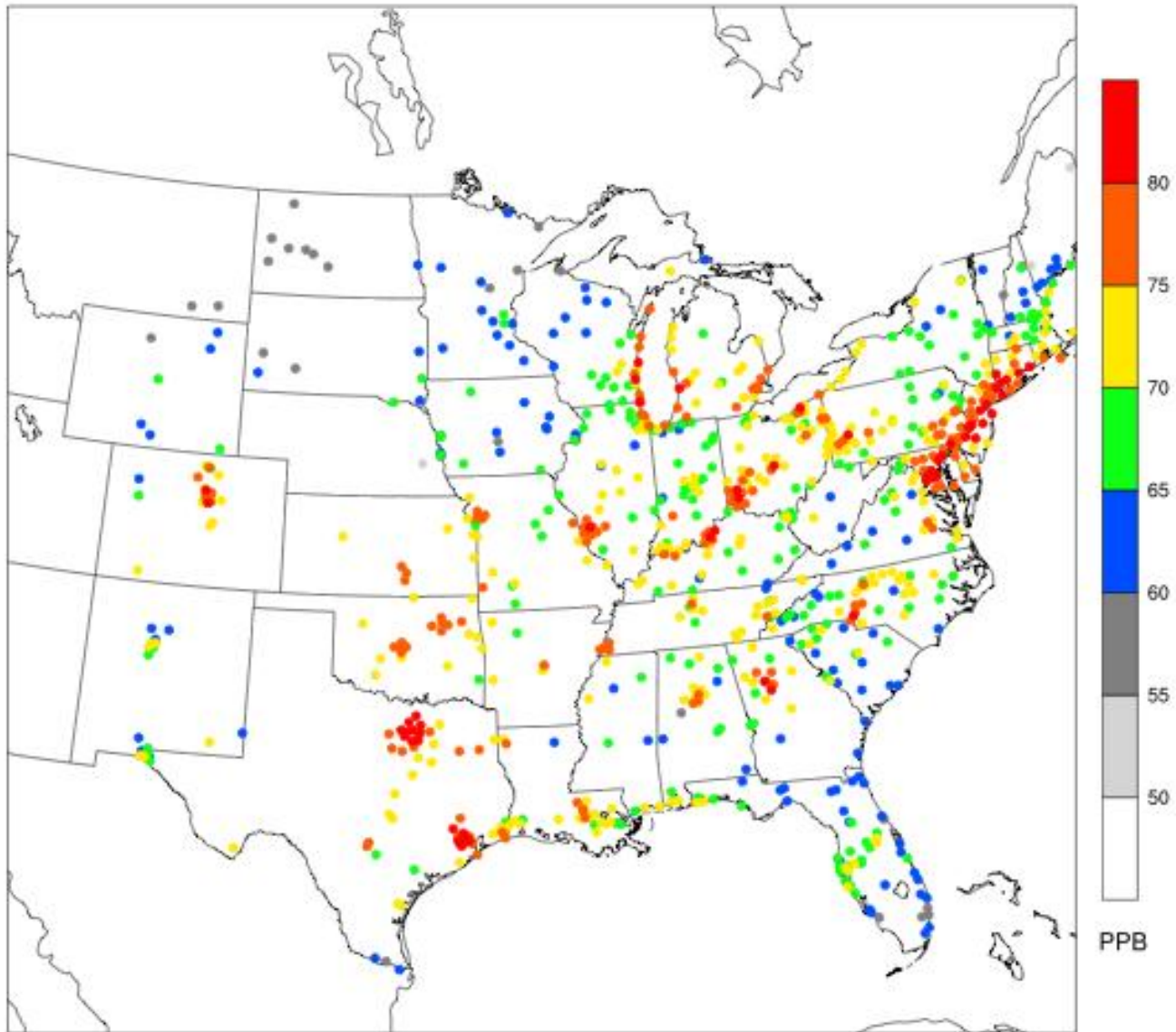
Model Attainment Test Software (MATS) Results

2018 Emissions

- Tier III proposed rule
 - MOVES-NPRM version (not MOVES 2014)
- CAIR
 - IPM 2018
- State/Federal “on-the-books” controls

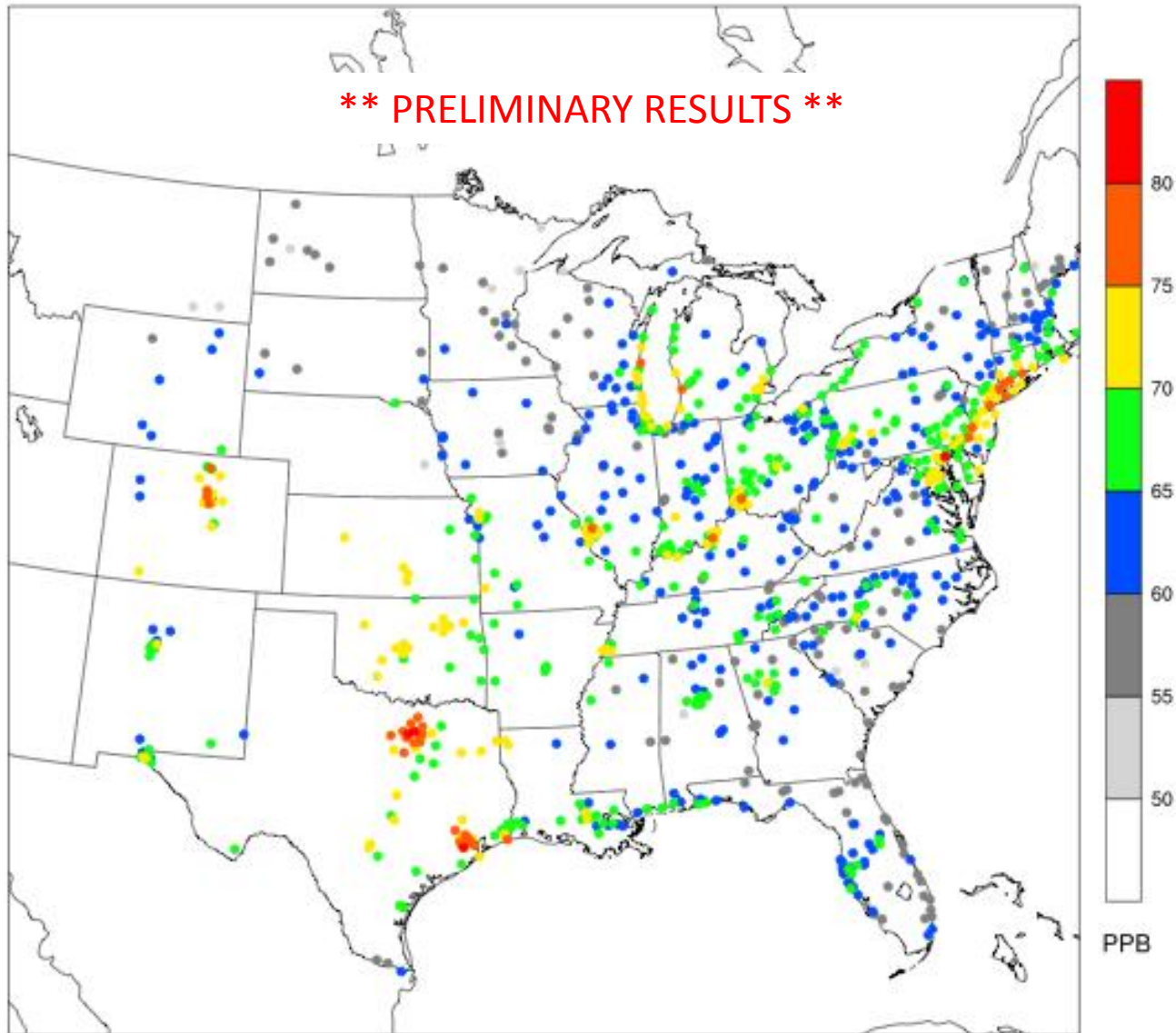
2011 MATS O₃ Design Values

8-HR O₃: 2011 MATS DV



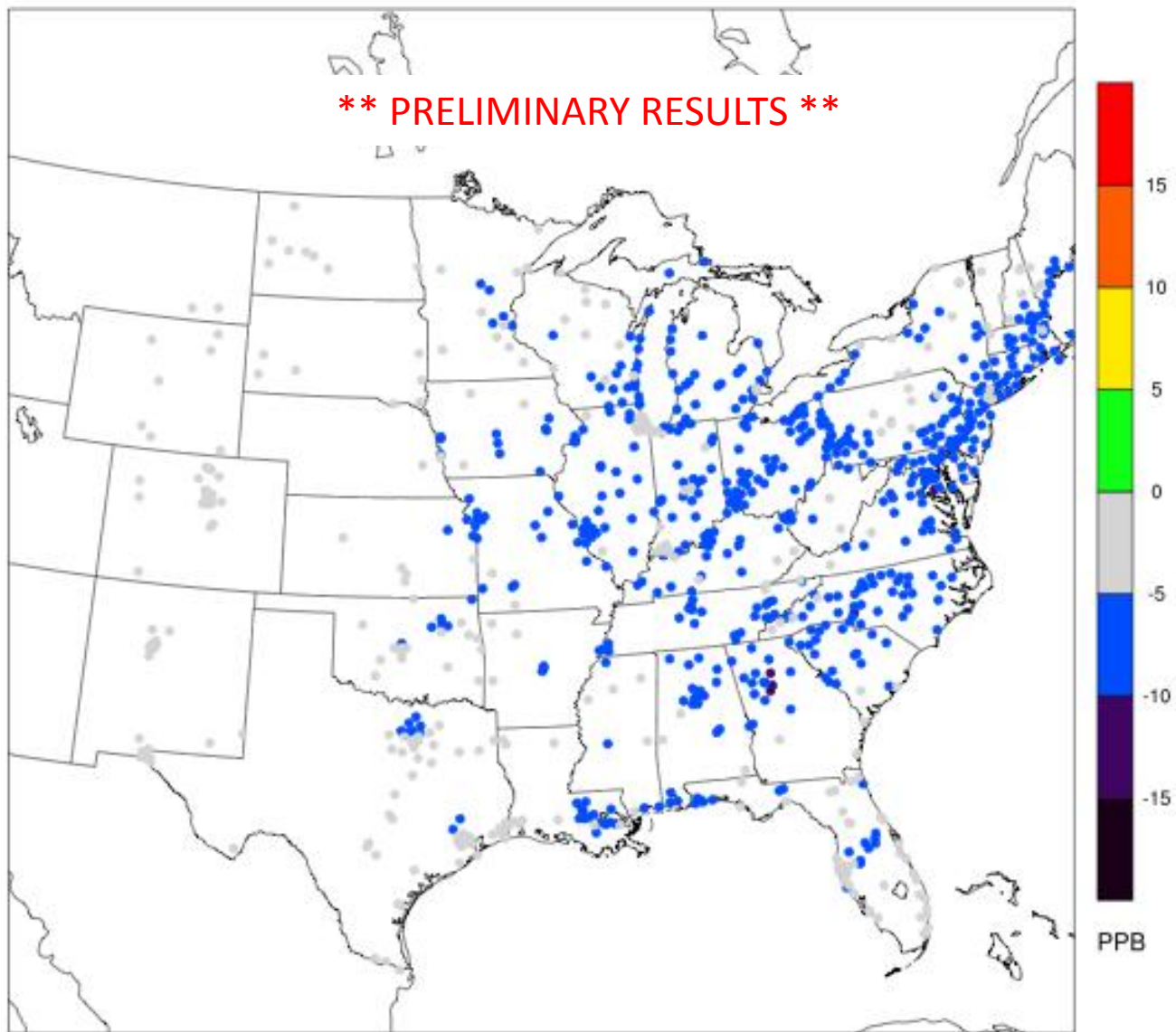
2018 MATS O₃ Design Values

8-HR O₃: 2018 MATS DV



2011 - 2018 MATS O₃ Design Values

8-HR O₃: 2011 - 2018 DV Difference



36KM CAMx modeling without minimum kv fix

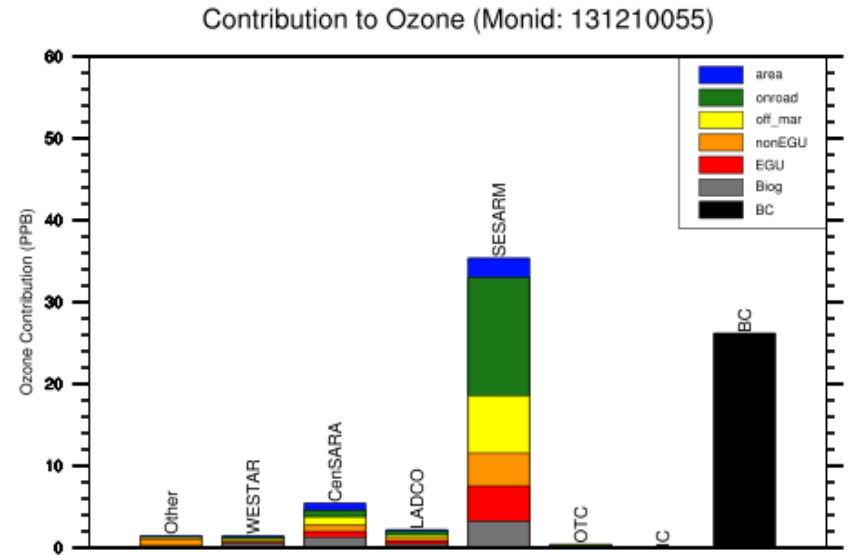
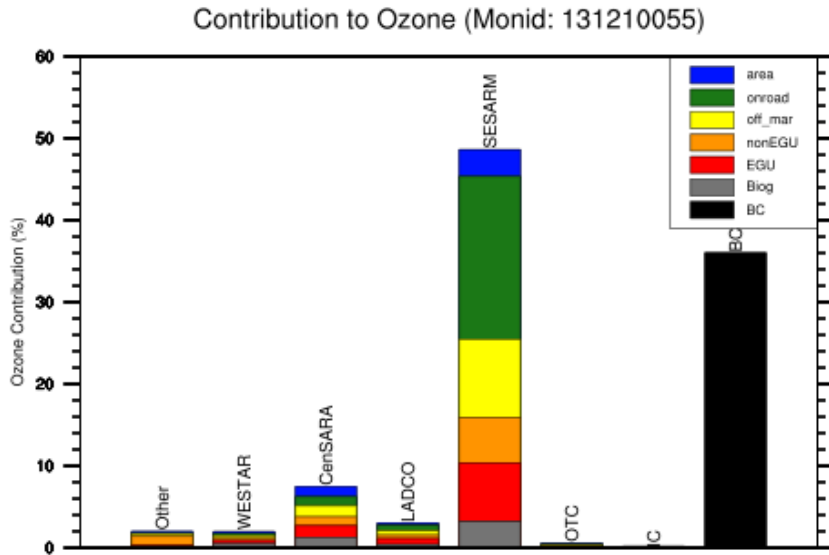
Ozone Source Apportionment (OSAT)

Source Apportionment Regions



Atlanta, GA

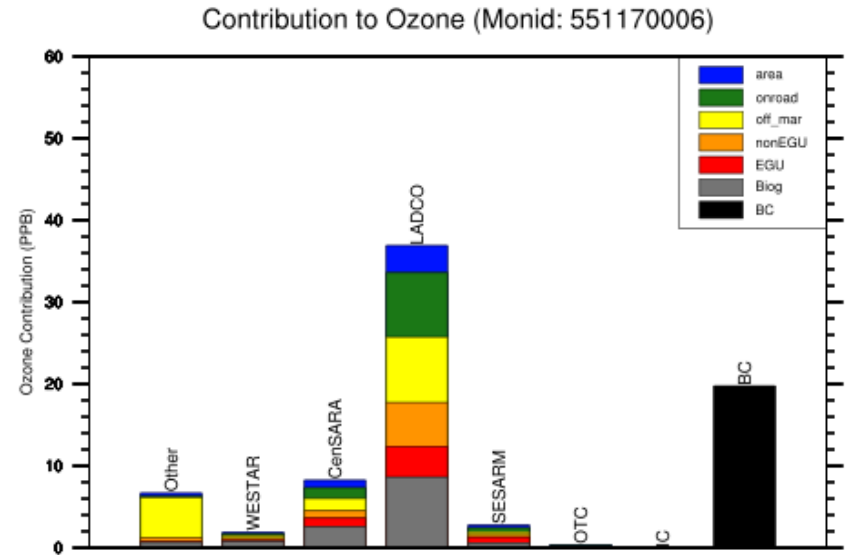
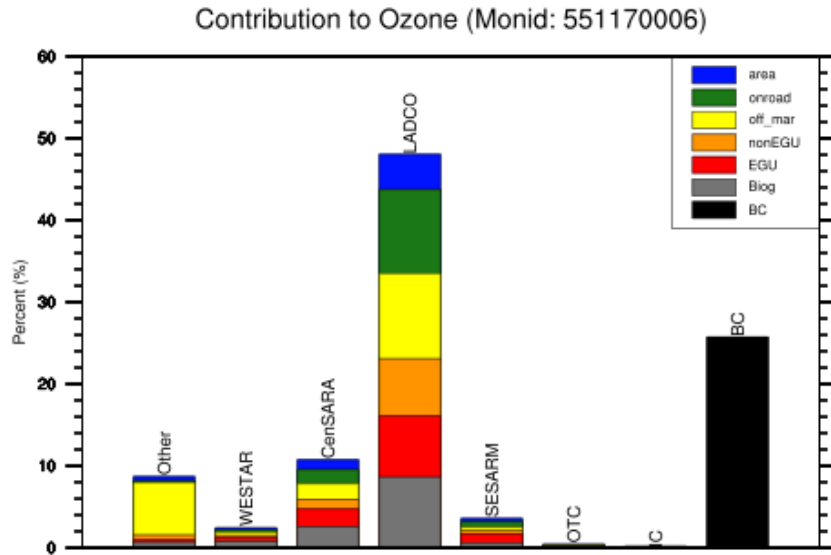
**** PRELIMINARY RESULTS ****



Ozone apportionment with a 65 PPB threshold

Sheboygan, WI

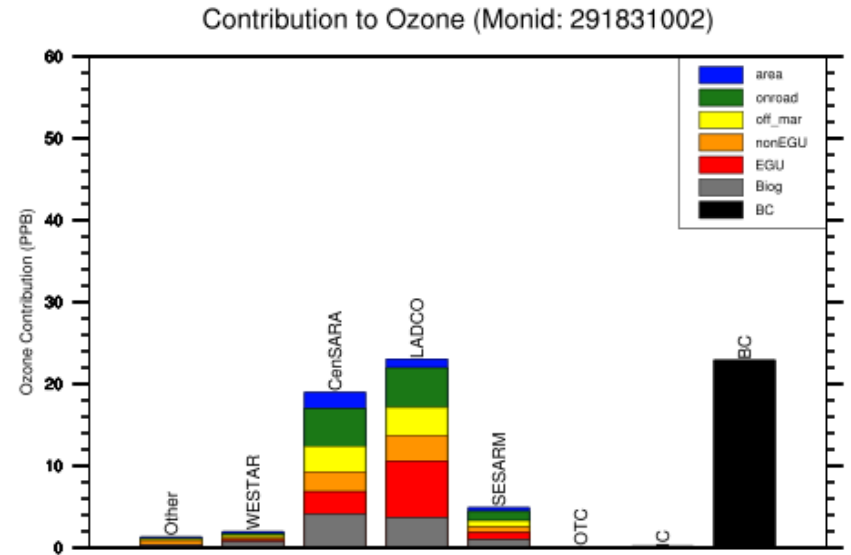
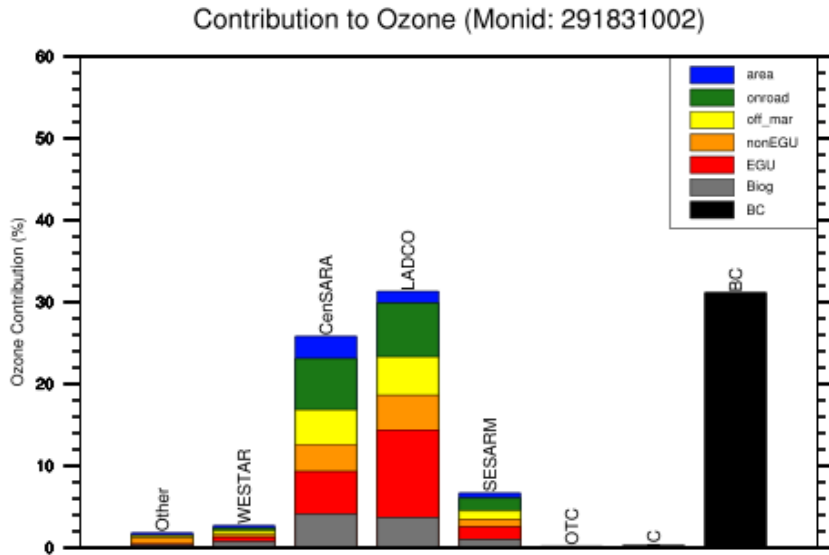
**** PRELIMINARY RESULTS ****



Ozone apportionment with a 65 PPB threshold

St. Louis, MO

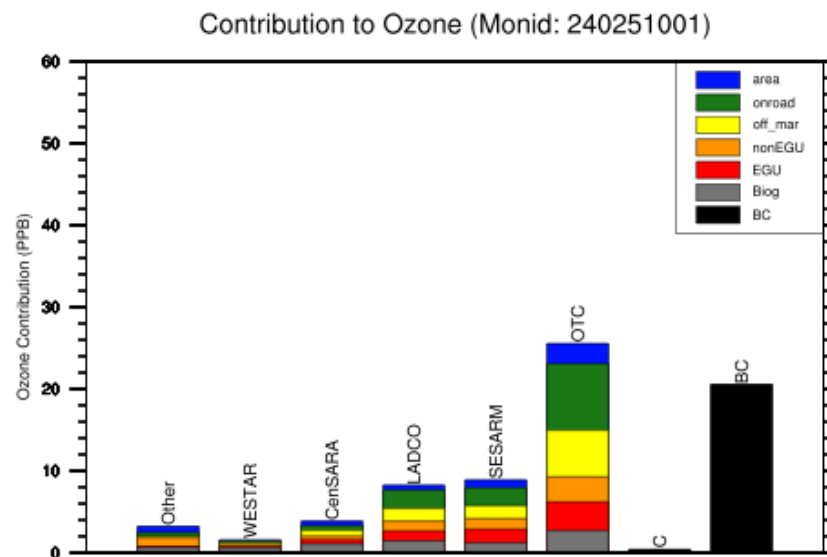
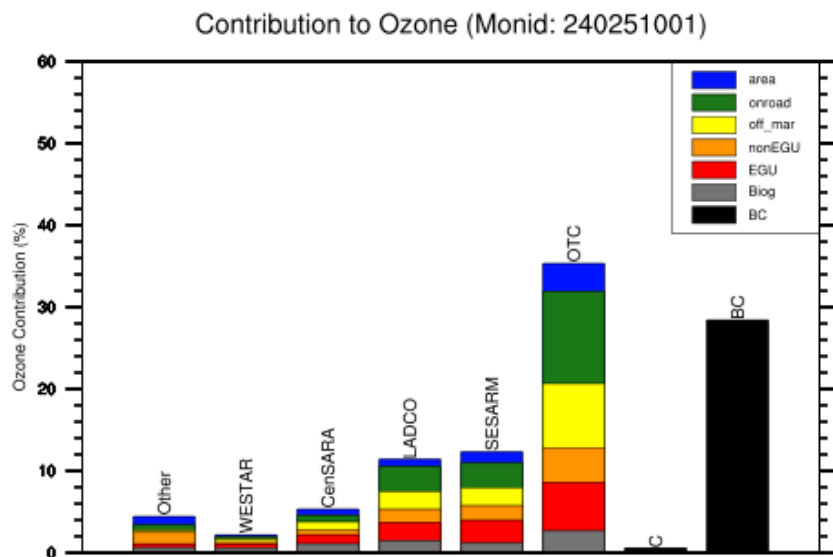
**** PRELIMINARY RESULTS ****



Ozone apportionment with a 65 PPB threshold

Harford, MD

**** PRELIMINARY RESULTS ****



Ozone apportionment with a 65 PPB threshold

Future Work

- CAMx V6.10 released 4/4/14
 - Re-emissions model (not PiG compatible)
 - CB6r2 Chemistry
 - Improved PiG algorithm
- ERTAC EGU emissions
 - Compare IPM and ERTAC
 - MATS (Mercury and Air Toxic Standards) sensitivity runs
- MEGAN biogenic emissions
- OSAT with more regions
- PM_{2.5} 2011 and 2018 annual modeling
 - PSAT