OTC Modeling Committee Update
OTC/MANEVU Annual Meeting
June 11, 2025

OTC Modeling Committee

Chairs, Kevin Civerolo and Eric Zalewsky, NYS DEC
Committee Lead, Alexandra Karambelas, OTC/NESCAUM





OZONE TRANSPORT COMMISSION

Accomplishments

Tracking O_3 exceedances and attainment status across the OTR

Completed expanded retrospective O_3 analysis (2016 platform)

- Comparison between modeled O_3 projections and actual monitoring observations in 2023
- Expanded analysis to include the rest of the 12OTC2 modeling domain

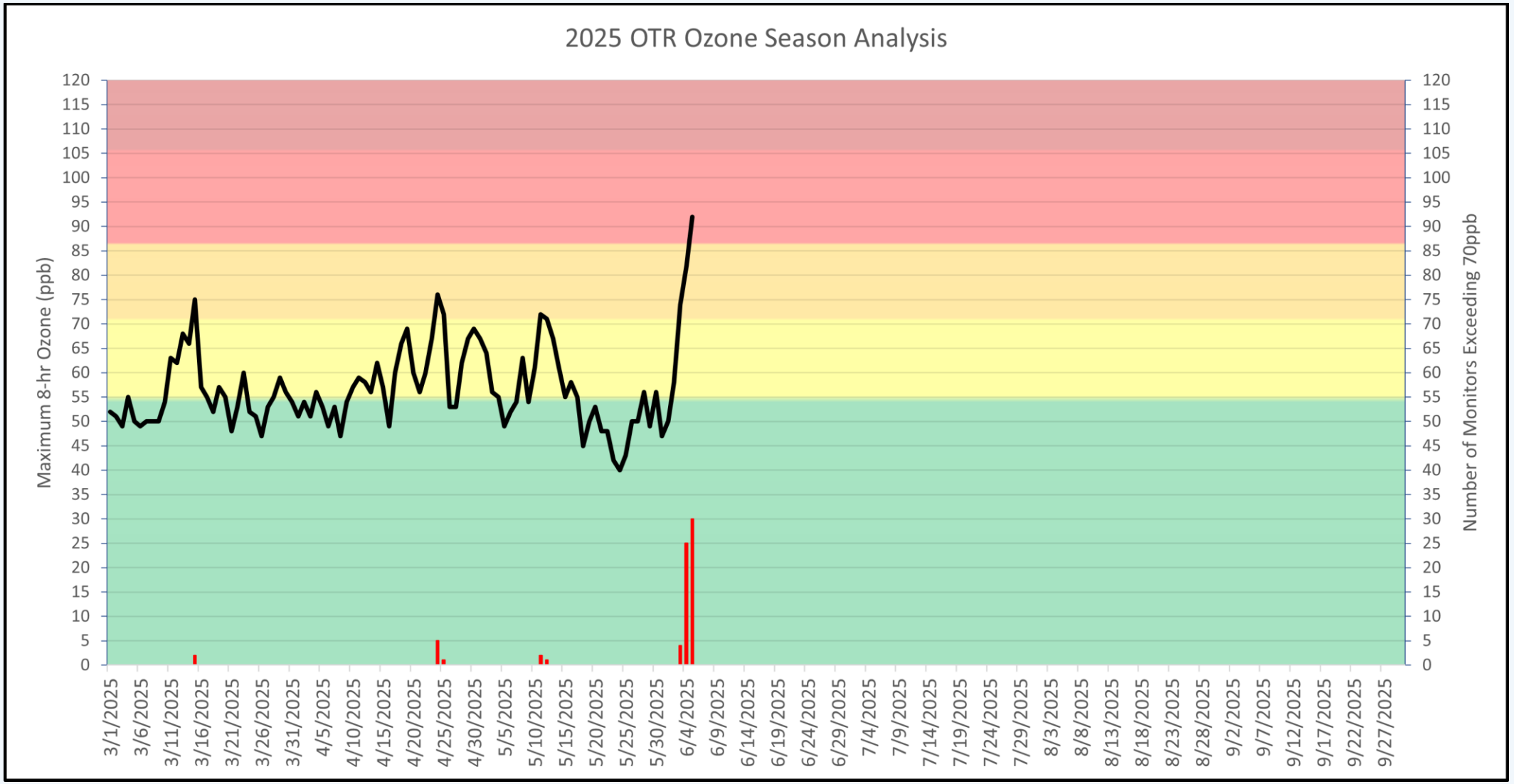
Photochemical model testing

- Boundary Condition: Hemispheric CMAQ (H-CMAQ) and GEOS-Chem
- Dry Deposition: STAGE and M3Dry
- Biogenic Emissions: BEIS and MEGAN

2022-24 Ozone Design Values (ppb)

State	Site	AQS Code	22-24 DV
CT	Greenwich	090010017	79
CT	Danbury	090011123	76
CT	Stratford	090013007	80
CT	Westport	090019003	80
CT	East Hartford	090031003	72
CT	Middletown	090079007	74
CT	New Haven (Criscuolo Park)	090090027	72
CT	Madison	090099002	76
CT	Groton (Fort Griswold)	090110124	71
MD	Essex	240053001	71
MD	Edgewood	240251001	71
NJ	Clarksboro	340150002	73
NJ	Lawrence (Rider University)	340210005	71
NJ	East Brunswick (Rutgers University)	340230011	71
NJ	Colliers Mills	340290006	71
NY	NYC (Queens College)	360810124	71
NY	East Farmingdale (Babylon)	361030002	72
NY	Old Field (Flax Pond)	361030044	72
NY	White Plains	361192004	71
PA	Bristol	420170012	73
RI	South Kingstown (East Matunuck)	440090008	72

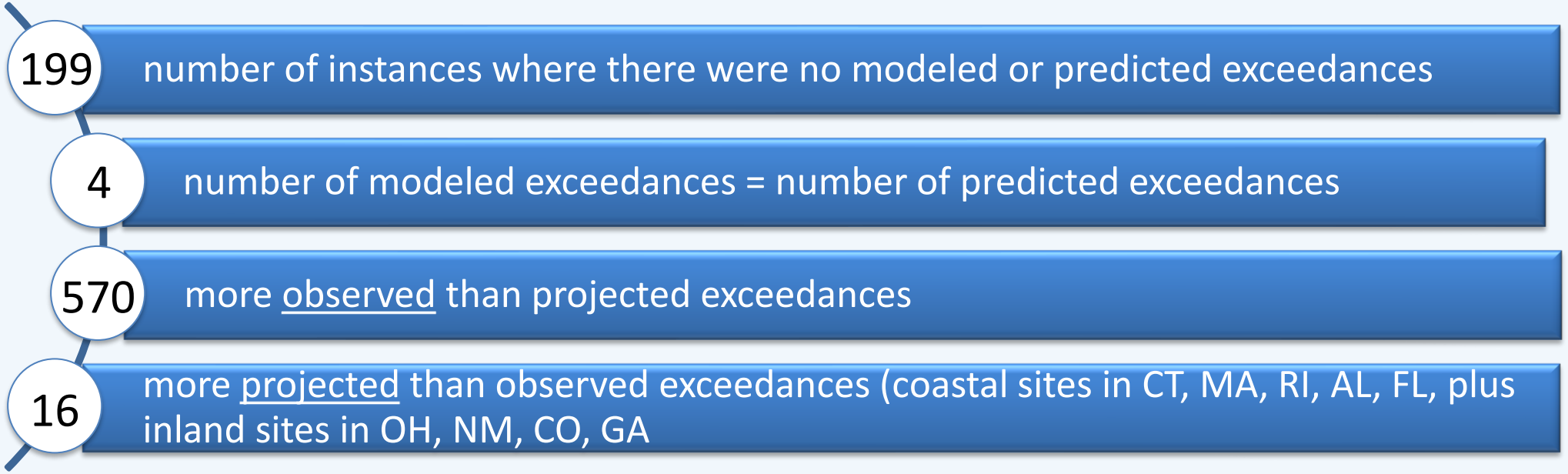
2025 OTR Summary To Date



Note: Data are Preliminary

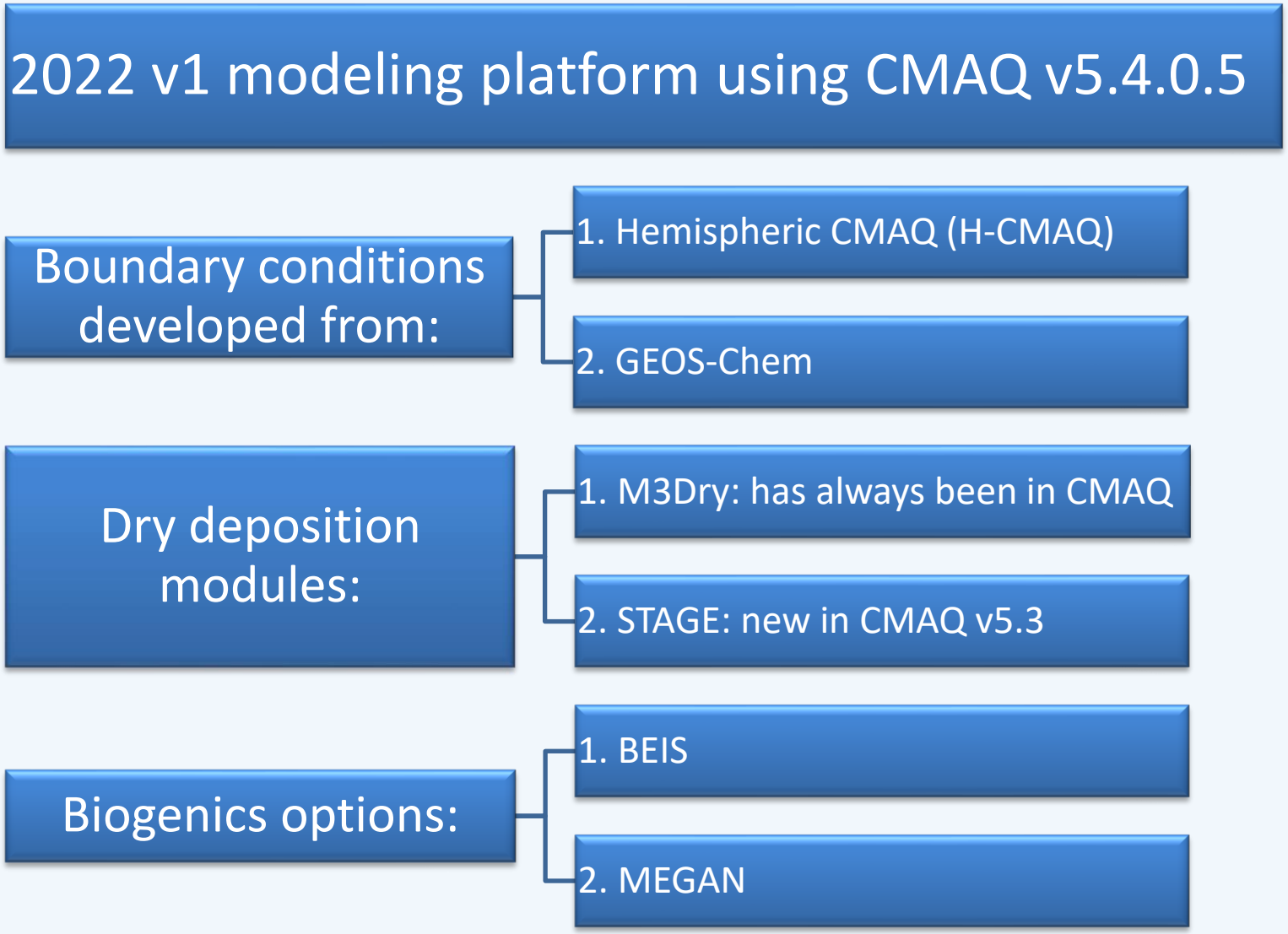
2023 Observed vs Projected Ozone (2016 Platform)

- CMAQ 2023 O_3 projected from 2016 base year
- 789 monitors in full 12OTC2 modeling domain



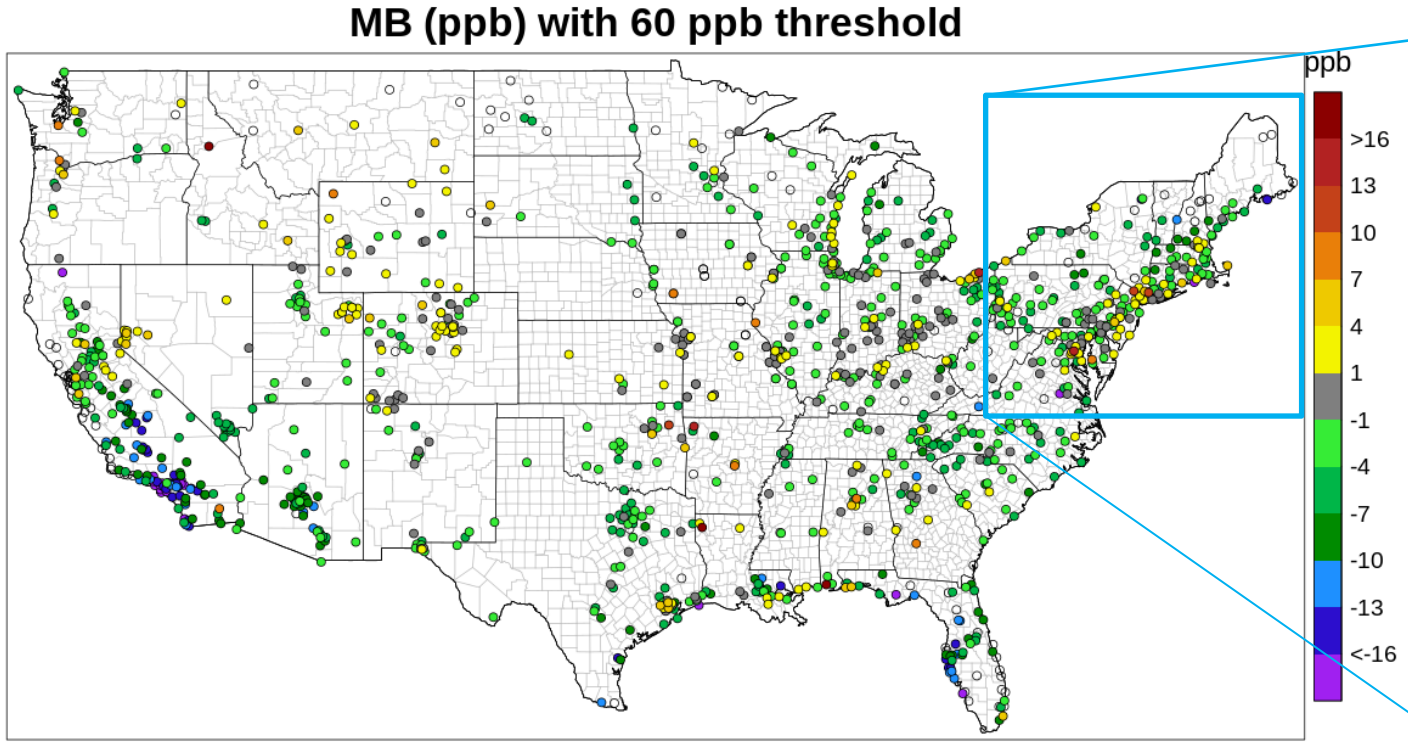
- Wildfire smoke had obvious impacts on observed O_3 in 2023
- OTC modeling has shown that modeled O_3 projections are generally lower than observed O_3 in 2023

Model Configuration Testing

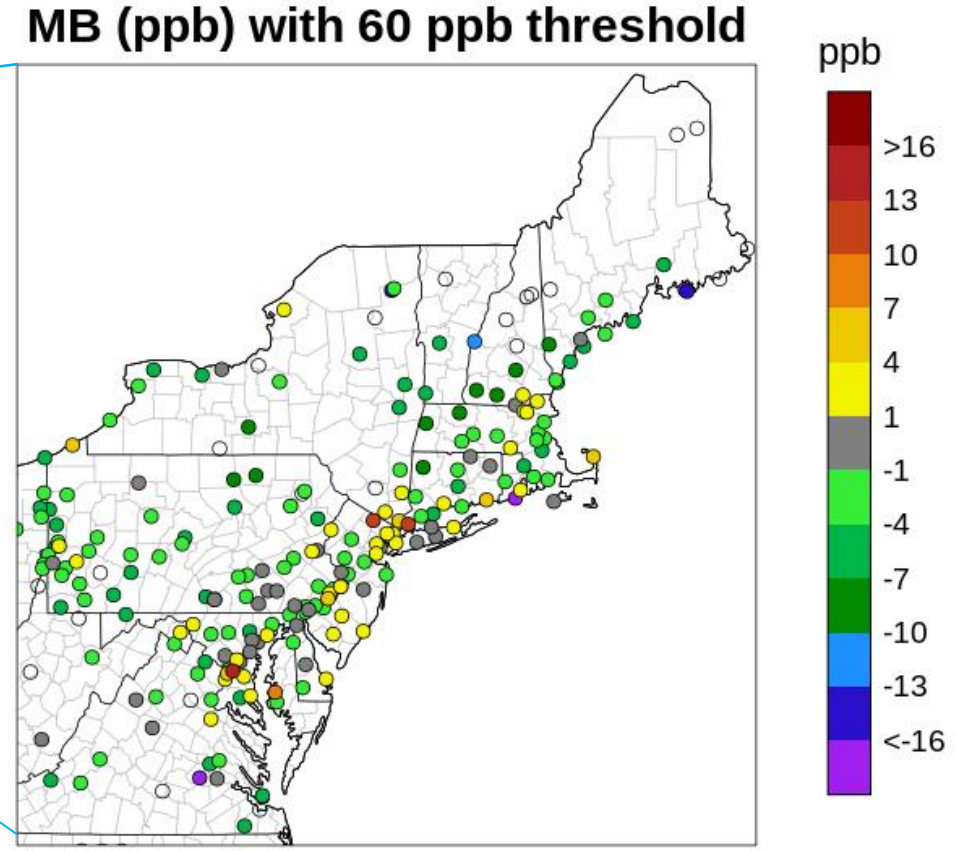


Mean Bias in MDA8 O_3 – May to Sep

H-CMAQ/M3Dry/MEGAN resulted in the smallest mean bias and mean error in the OTR

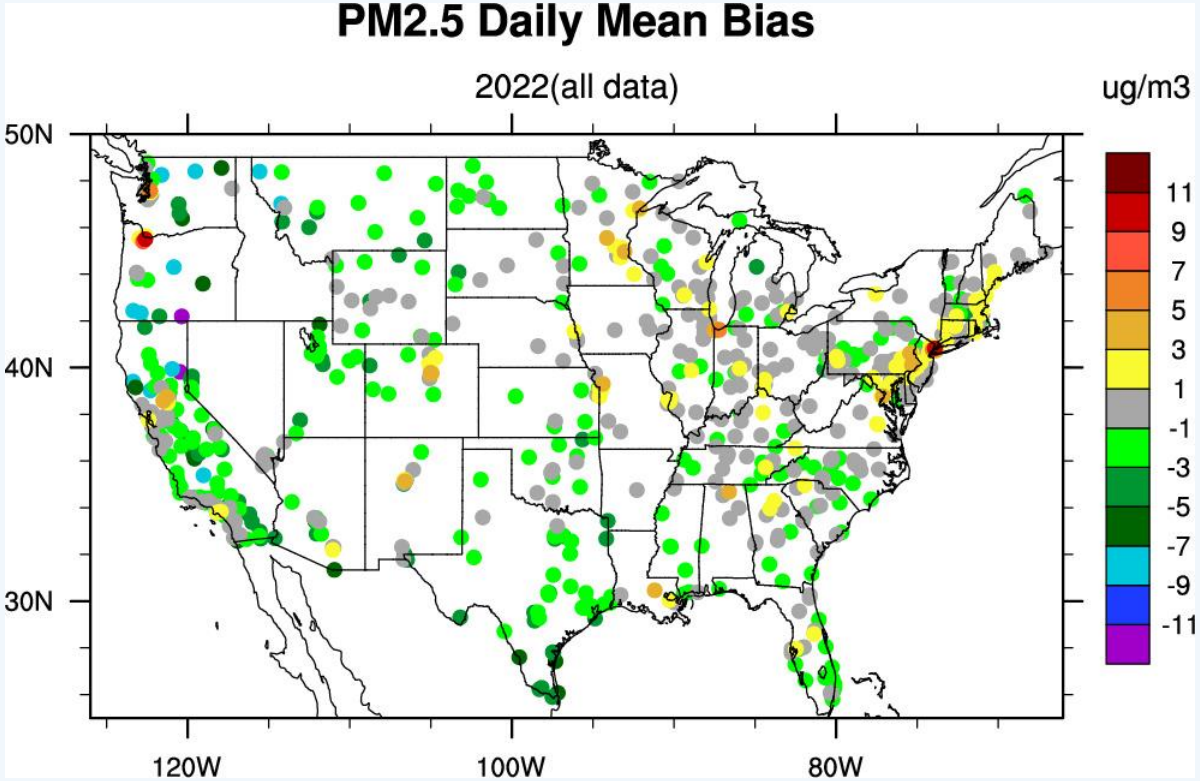


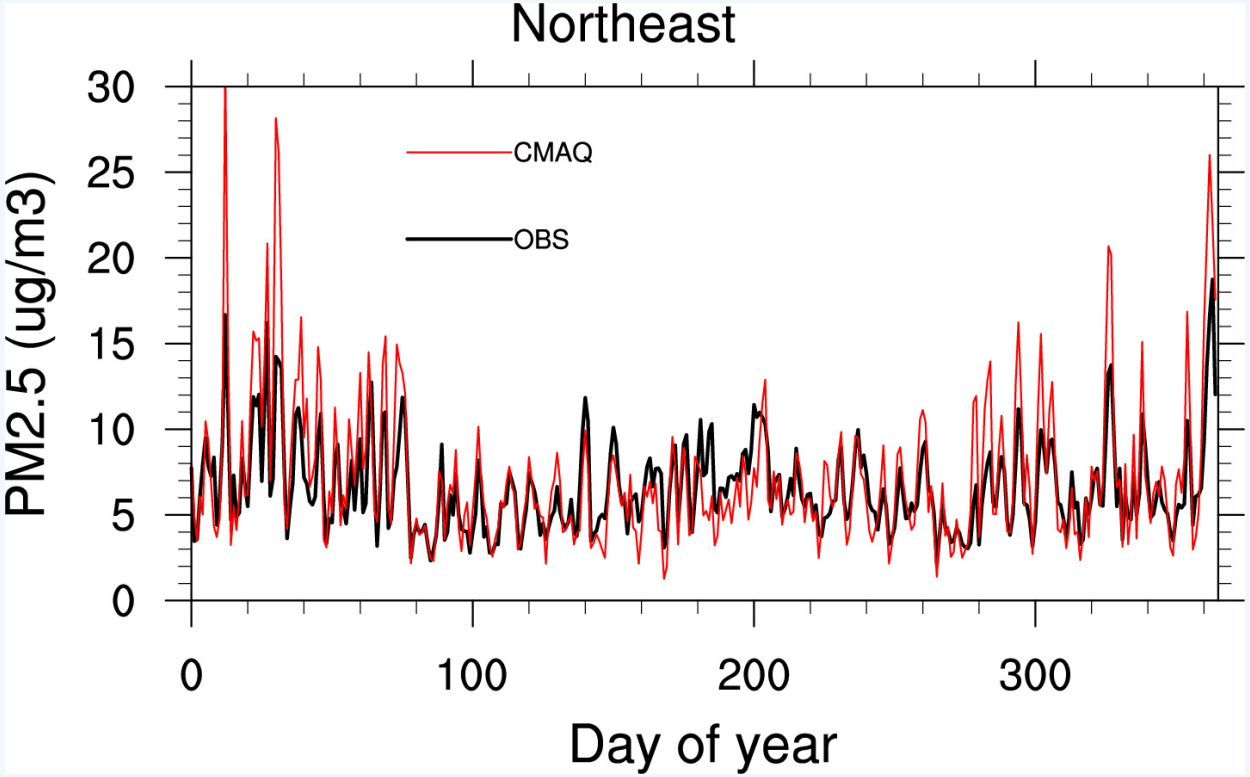
CMAQ v54p5, 12US2, 2022hc, H-CMAQ/M3Dry/MEGAN, EPAEGU, may-sep



CMAQ v54p5, 12US2, 2022hc, H-CMAQ/M3Dry/MEGAN, EPAEGU, may-sep

Mean Bias in Annual $PM_{2.5}$





Ongoing Initiatives

Continue working with EPA, states, MJOs on 2022 modeling platform – 2022 base year and 2026 analytic year

- 2022 v1, base year released September/October 2024, analytic year (2026) February 2025
  - EPA platform uses IPM; OTC will incorporate ERTAC EGUs
- 2022 v2, base year to be released this spring
- Initial AQ modeling to focus on base year evaluation and 2026 O_3 DVs

Updating Modeling Committee Action Plan

Began work on Modeling Technical Support Document

Summary

- Regional modeling with the 2022 v1 emissions platform using CMAQ with EPA's EGU emissions is currently being evaluated, new 2022 v2 platform is coming later this year
- 2022 v1 base year and 2026 analytic year modeling using CMAQ with ERTAC EGU emissions is ongoing
- H-CMAQ/M3Dry/MEGAN configuration yields the best model performance for high O_3 days in the eastern US
- O_3 non-attainment is still an issue in the OTR, and cross-committee efforts to develop emissions sensitivity tests are ongoing

Thank you!

Model Committee Chairs

- Kevin Civerolo and Eric Zalewsky, NYSDEC (kevin.civerolo@dec.ny.gov and eric.zalewsky@dec.ny.gov)

OTC Committee Lead

- Alexandra Karambelas, OTC/NESCAUM (akarambelas@nescaum.org)

Emissions Inventory Lead

- Susan McCusker, MARAMA (smccusker@marama.org)

O_3 Season Updates

- Marcus Chase, NHDES (marcus.a.chase@des.nh.gov)