

OTC Modeling Committee Update

OTC/MANEVU Virtual Public Stakeholder Webinar

October 9, 2026

OTC Modeling Committee

Chairs, Eric Zalewsky and Ruby Tian, NYS DEC
Committee Lead, Alexandra Karambelas, OTC/NESCAUM



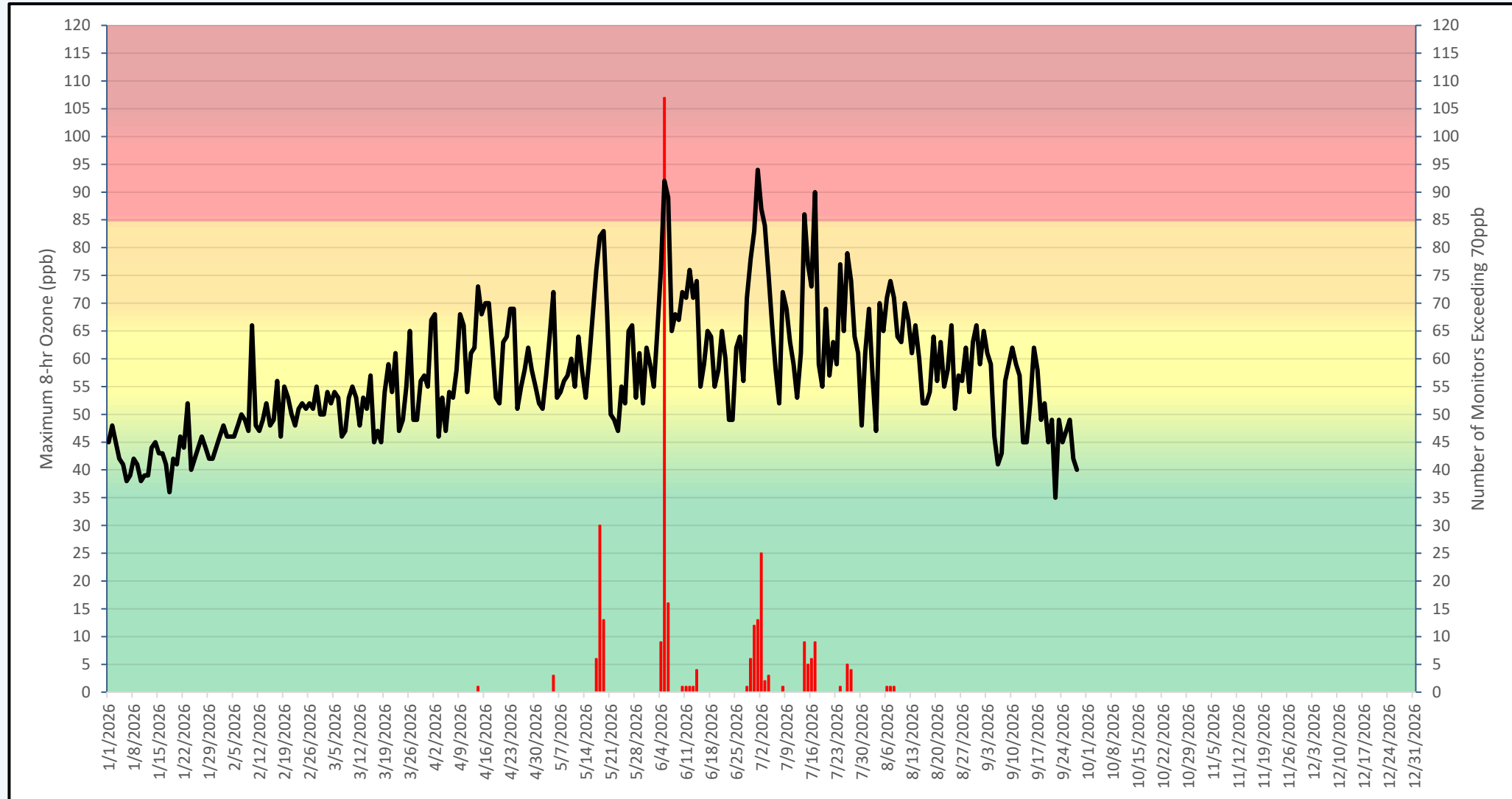
OZONE TRANSPORT COMMISSION

Announcements/Accomplishments

- Tracked current OTR O₃ levels and preliminary attainment status
- Kept up-to-date on ongoing work for the 2022 emissions platform analytic year development
- Examined the effects of vehicle age distribution in lookup table mode of MOVES5.0.1
- Completed a two-part study on quantifying 2023 Canadian wildfire impacts on ozone concentrations
- Examined the impacts of NO_x reductions on winter season nitrate (NO₃)

2026 Maximum Daily Average 8-hr Ozone in the OTR

2026 OTR Maximum Daily Average 8-hour [MDA8] Ozone Analysis



OBS data prepared by Marcus Chase (NH DES) – data through 09/28/2026

2026 Preliminary Monitored Ozone Design Values

* All the exceeding monitors may be impacted by Canadian Wildfires in 2024, 2025 and 2026

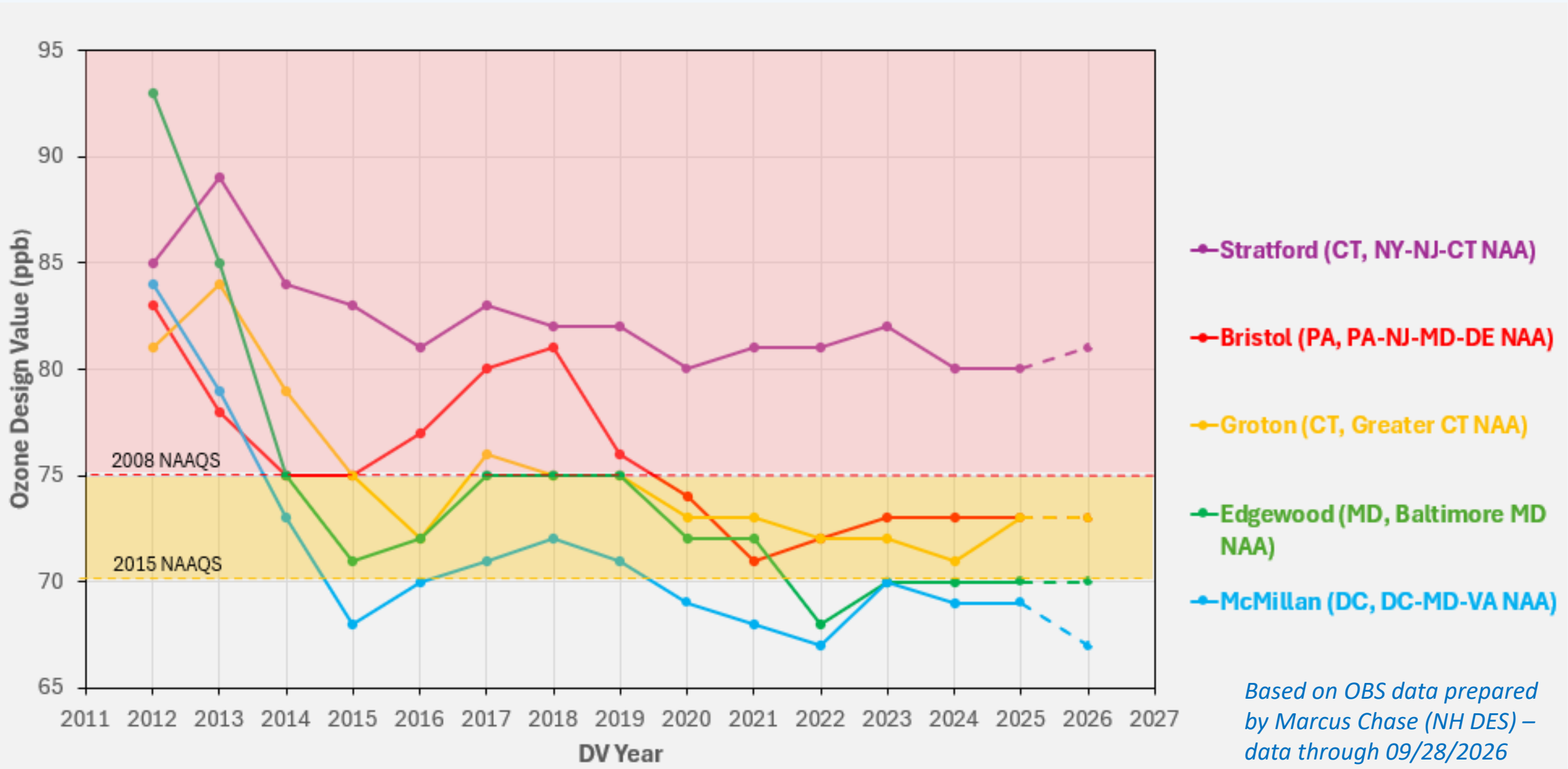
Four states with 20 sites having 2026 DV above 2015 NAAQS

All Data are preliminary

OBS data prepared by Marcus Chase (NH DES) – data through 09/28/2026

Monitors w/24-26 DV in Violation of 2015 NAAQS			
Agency	Site	AQS Code	24-26 DV
CT	Greenwich	090010017	78
CT	Danbury	090011123	78
CT	Stratford	090013007	81
CT	Westport	090019003	80
CT	East Hartford	090031003	73
CT	Middletown	090079007	76
CT	New Haven (Criscuolo Park)	090090027	72
CT	Madison	090099002	77
CT	Groton (Fort Griswold)	090110124	73
CT	Stafford	090131001	73
NJ	Leonia	340030006	71
NJ	Titusville (Wash. Crossing)	340219991	71
NJ	Jackson (Colliers Mills)	340290006	71
NY	NYC (Pfizer Lab)	360050133	71
NY	NYC (CCNY)	360610135	71
NY	NYC (Queens College)	360810124	71
NY	Old Field (Flax Pond)	361030044	73
NY	White Plains	361192004	73
PA	Bristol	420170012	73
PA	Philadelphia (North East Waste)	421010048	73

Time Series of Monitored Ozone Design Values



Modeling Platform Updates

- 2022v2 base year Emissions Modeling Platform (EMP) is available
 - <https://gaftp.epa.gov/Air/emismod/2022/v2/>
- 2032v2 analytic year EMP development is underway
 - Projection workgroups for a few sectors:
 - EGU/Industrial Point, Onroad/Nonroad, nonpoint, Oil & Gas
- Tentative timeline and important dates for SLTs:
 - Sept – Dec 2026:
 - SLT Data Collection (e.g., growth activity data, growth rates, state rules, closures)
 - April 2027
 - Draft 2032v2 inventory release , 30-day SLT review period
 - June/July 2027
 - Final 2032v2 release
- **Request:** Timeline considerations for OTC/MANEVU planning and modeling?

VADEQ Study on MOVES

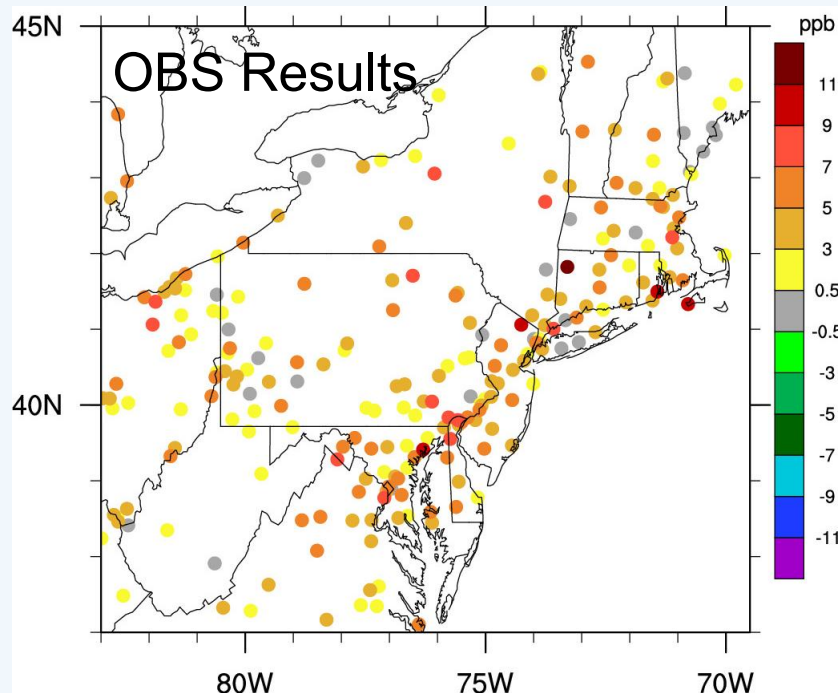
VADEQ examined EPA MOVES5.0.1 and the impacts of vehicle age distribution in SMOKE-MOVES

- The representative county approach in SMOKE-MOVES results in younger fleet average ages than those in actual state department of motor vehicle (DMV) data for individual counties. Some states have no old vehicles in the entire state at all according to MOVES representative counties.
- The fleet age distributions for some states have no county-specific variations for certain vehicle types (53/62 long-haul truck) due to the use of representative counties. This approach results in a one-age-distribution for the entire state.
- Mixing state data with data derived in regional efforts introduces inconsistencies in air quality modeling and source apportionment modeling.

NYSDEC Study: 2023 Canadian Wildfire Impacts on Ozone Concentrations – from Observations

Developed a methodology to estimate fire contributions to ozone concentrations with smoke identified using the NOAA Hazard Mapping System (HMS)

4th Highest MDA8 O₃ Diff (Apr. to Sept.)



A 5-Step Approach



Step1: Identify **Extremely High O₃ Days** based on 99th percentile from previous **five** years of ozone season MDA8 value

Step2: Define **Smoke Impacted Days** in **2023** with NOAA HMS

Step3: Classify **Smoke-impacted Extremely High O₃ Days** where **Step1** and **Step2** overlap in **2023**

Step4: Find 4th-Highest MDA8 O₃ from the original data AND when excluding **Smoke-impacted Extremely high O₃ days** in **2023**

Step5: The differences between the two 4th-Highest MDA8 values from **step 4** are the smoke impacts at each monitoring site

NYSDEC Study: 2023 Canadian Wildfire Impacts on Ozone Concentrations – from Model Simulations

Case1: Base 2023 modeling with **all fires**

Case2: 2023 modeling **without Canadian fires**

12US4 Domain

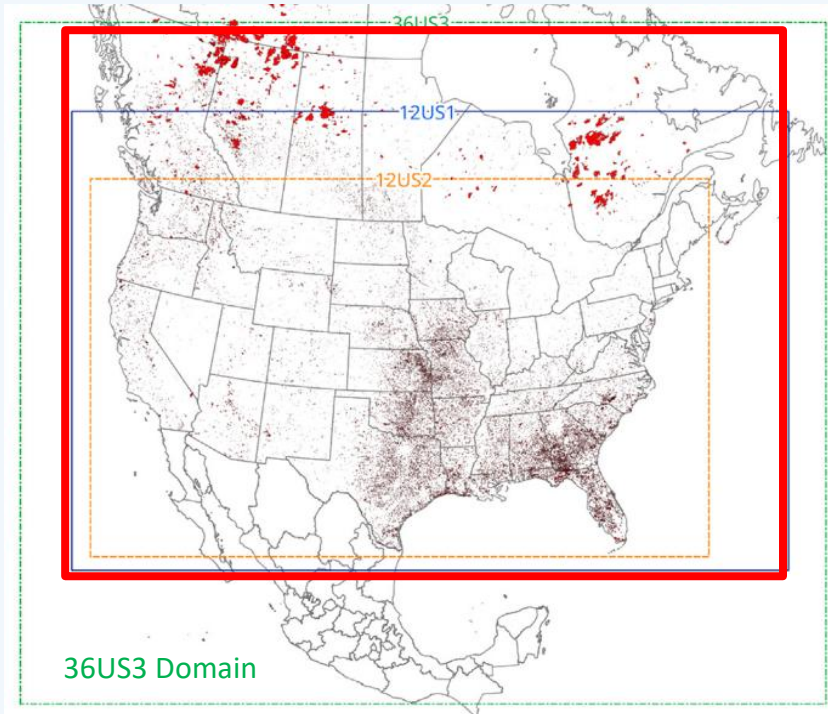
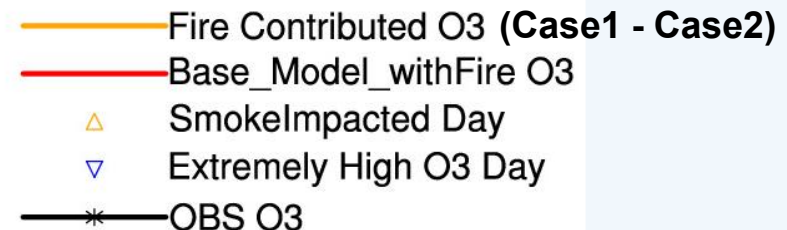
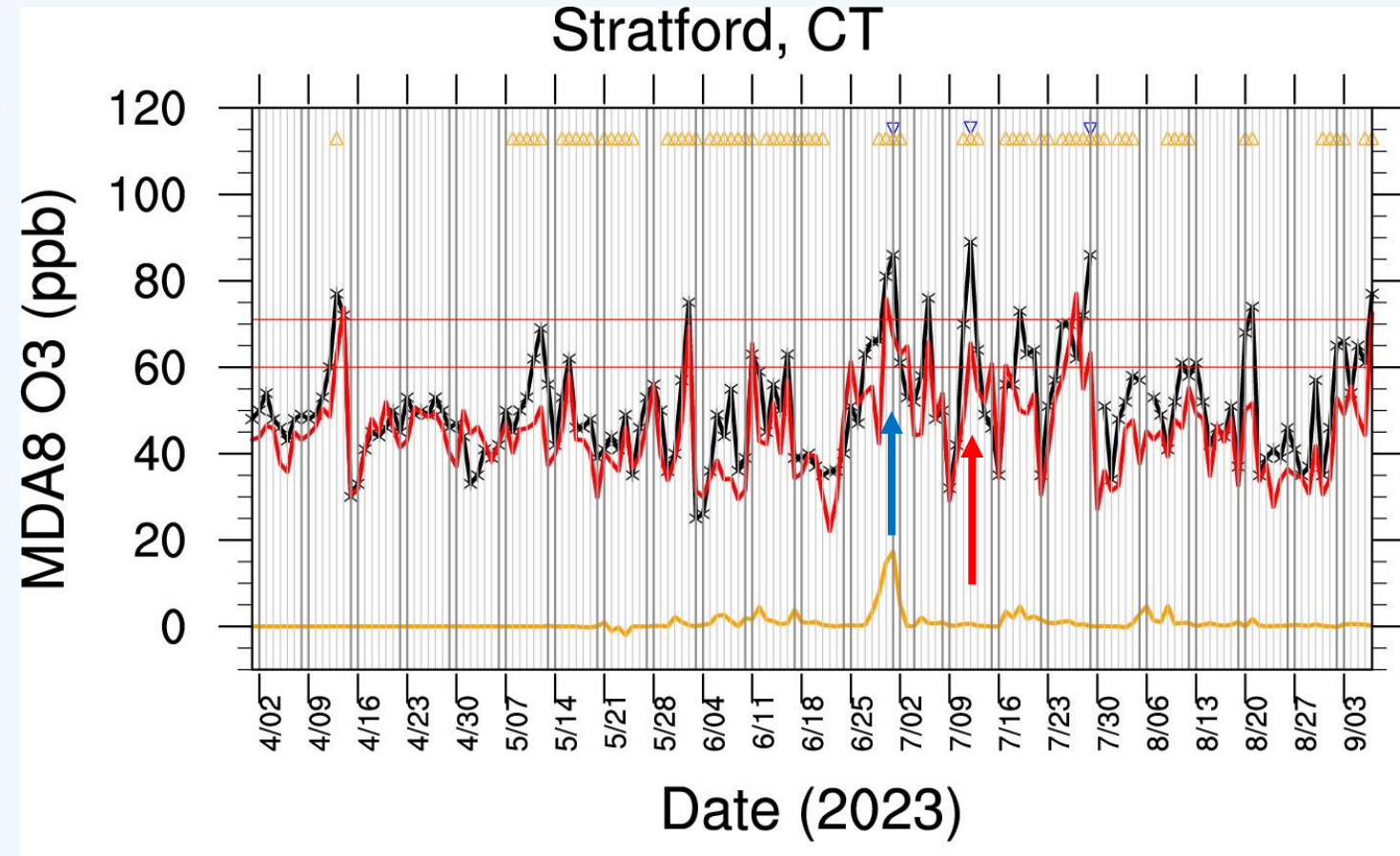
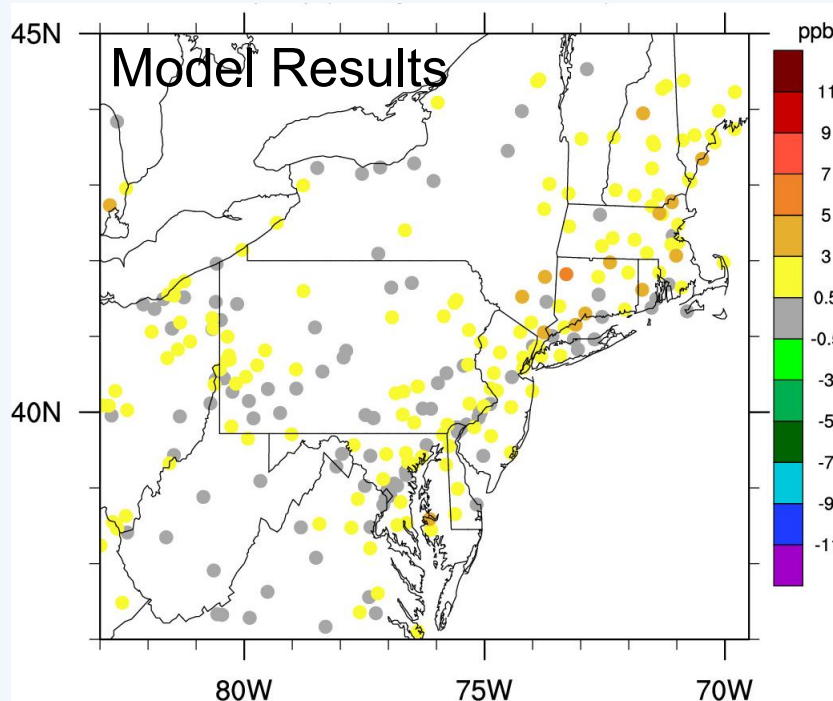


Figure credits: Simon et. al. (2024), Expedited modeling of burn events results (EMBER): A screening-level dataset of 2023 ozone fire impacts in the US, *Data in Brief*, Volume 58, Dec. 2024



NYSDEC Study: Model Underestimates Ozone on Smoky, High Ozone Days

4th Highest MDA8 O₃ Diff (Apr. to Sept.)



- Model doesn't simulate well for long-range transported smoke's impacts
- Fire emissions are not accurate yet
- Photochemical reactions need improvement

OTR NAA Area	OBS 4 th Highest Diff [ppb] (by 99 percentile threshold, O ₃ with fire minus O ₃ without fire)**	Modeled 4 th Highest Diff [ppb] (Case1 with fire minus Case2 without fire)**
NY-NJ-CT	3.12	1.50
Greater CT	5.67	2.66
PA-NJ-MD-DE	4.0	0.83
Baltimore MD	4.0	0.92
DC-MD-VA	4.0	0.45

** Only include sites having more than 5 days of high O₃ days (MDA8 O₃ >= 60ppb) from modeling results. All OBS monitoring sites are paired with the selected modeling sites.

NYSDEC Study: Co-benefit of Applying NOx Reductions Annually

35% reduction in NOx emissions from all anthropogenic sources in the OTR for analytic year (AY) 2026 using the 2022v1 platform:

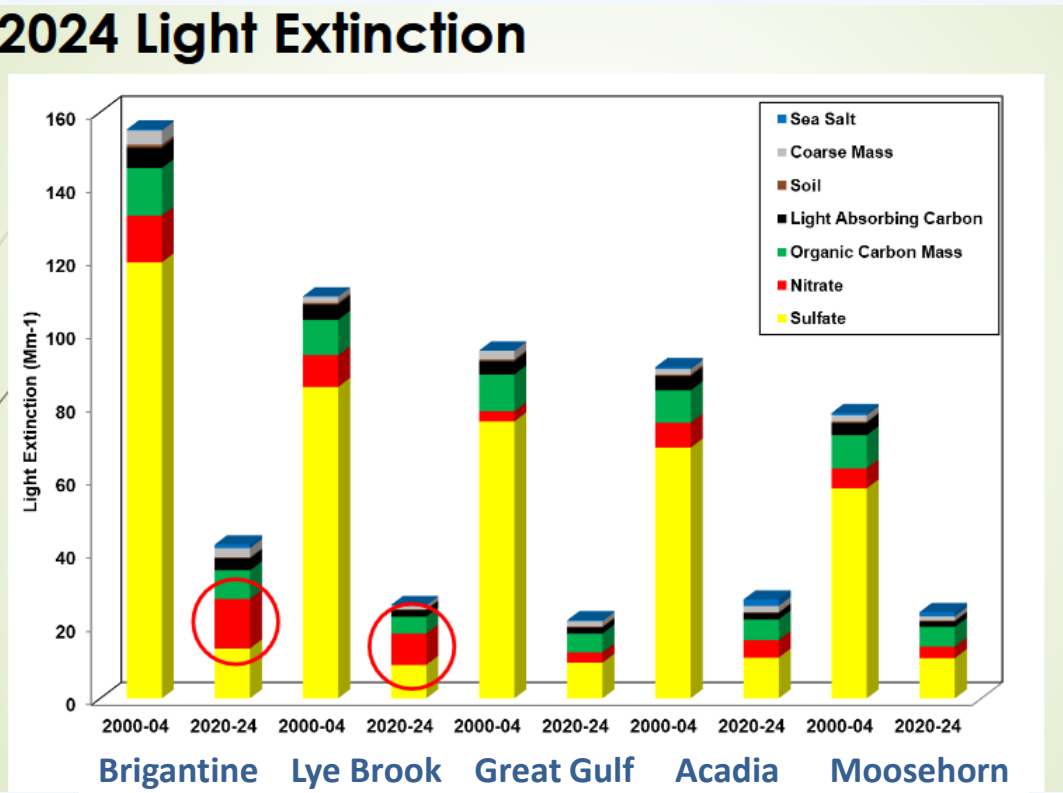
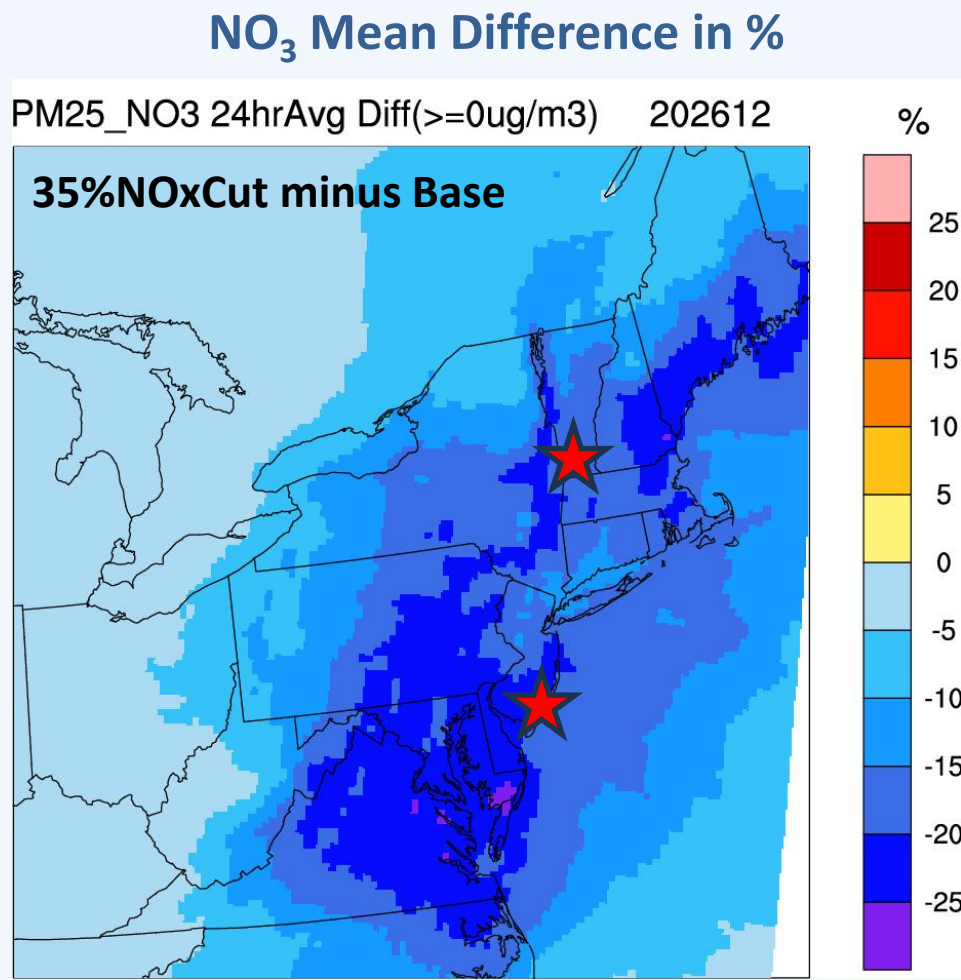


Figure credits: Sharon Davis and Dave Healy, MANE-VU Technical Support Committee, OTC/MANEVU 2026 Annual Meeting, June 3, 2026.



NO₃ Mean Difference in %

Site Name	Nov. 2026
Lye Brook	-11%
Brigantine	-15%

Site Name	Dec. 2026
Lye Brook	-16%
Brigantine	-23%

Other Ongoing Initiatives

- Continue working with EPA, states, MJOs on 2022v2 modeling platform
 - EPA and Collaborative working on 2032 analytic year (AY) inventory for v2
- Continue evaluating updated model components/modules
- Work with other committees to accommodate modeling needs

Key Messages

- EPA 2022v2 base year emissions platform is available, inventory for 2032 analytic year available in summer 2027.
- Canadian wildfires in 2023 had significant impacts on O₃ concentrations from both observational and modeling perspective. However, observational data showed greater fire impacts than model simulations.
- There are substantial reductions in NO₃ when applying 35% NO_x reductions in the winter season, which is a co-benefit of applying NO_x reductions annually.
- Non-attainment continues to be an issue in the OTR, and we will continue our cross-committee collaboration to develop emission reduction strategies.

Thank you!

Model Committee Chairs

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OTC Committee Lead

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

Emissions Inventory Lead

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

O₃ Season Updates

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

VADEQ Presentations on Github:

<https://vadeq-airquality.github.io/vadeq-presentations/>