

OTC Modeling Committee Update

Fall 2023 OTC/MANEVU Stakeholders Meeting

September 21, 2023

OTC Modeling Committee

Chairs, Kevin Civerolo and Margaret LaFarr, NYS DEC
Committee Lead, Alexandra Karambelas, OTC/NESCAUM

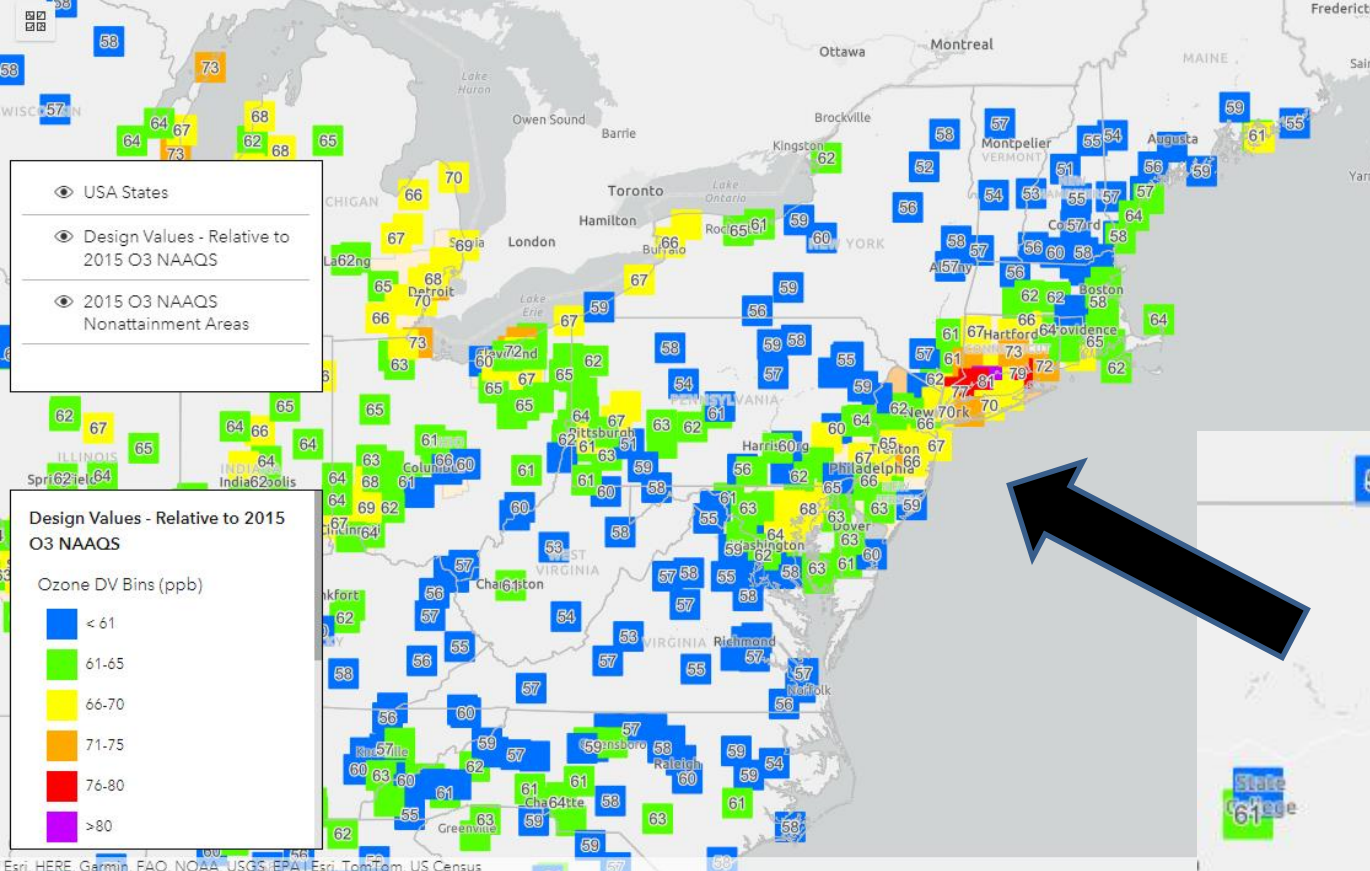


OZONE TRANSPORT COMMISSION

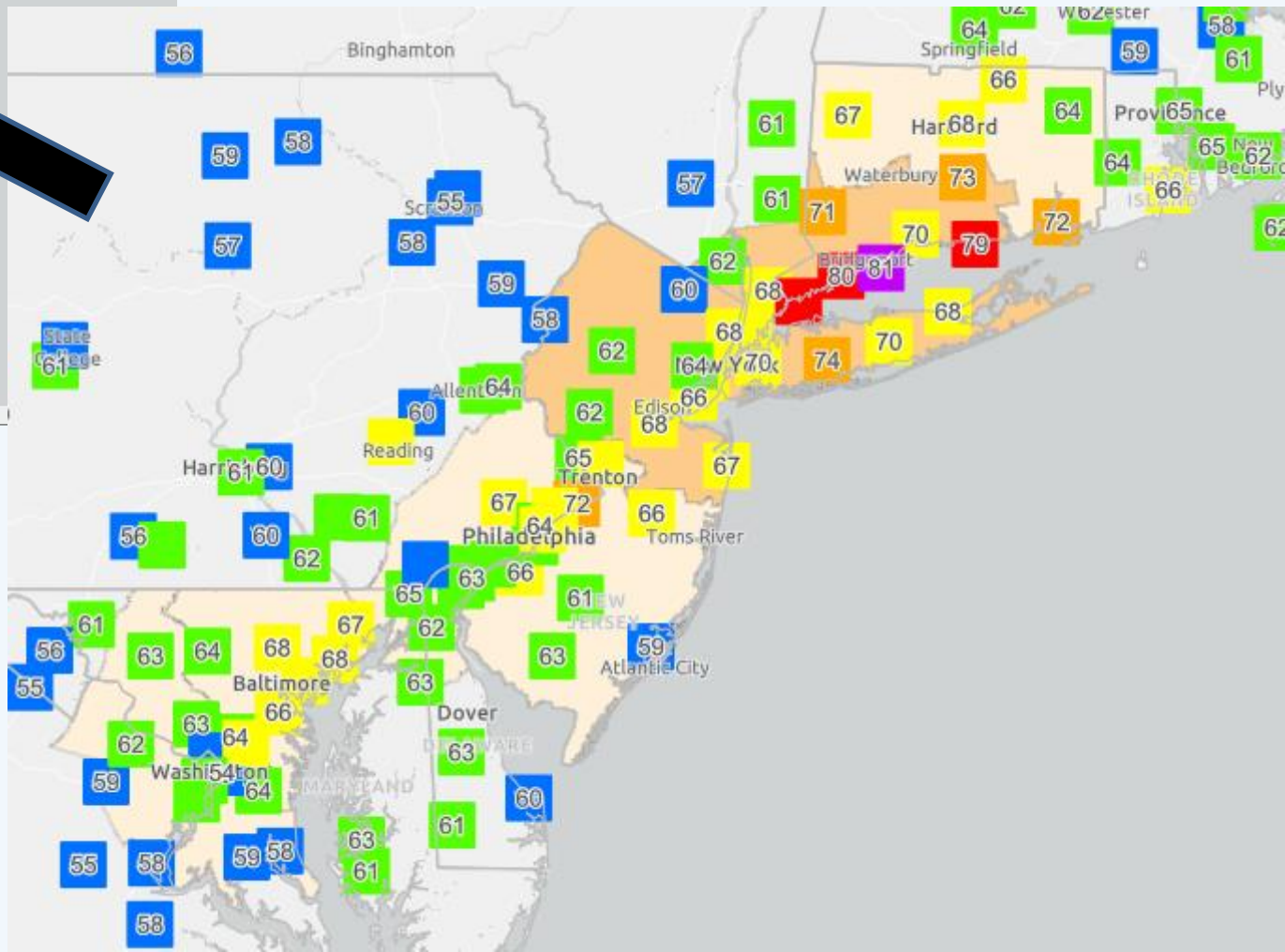
Accomplishments

- Tracked current OTR O₃ levels and preliminary attainment status
- Completed 2016 & 2023 simulations with CMAQ and CAMx – V1 platform (Emissions Collaborative), with ERTAC v16.1
- Completed V1 Technical Support Document – OTC website February 2023
- Completed 2016/2023/2026 simulations with CMAQ and CAMx – EPA V2 platform with V3 updates to CMV & solvents (“V2/V3”), with ERTAC v16.2
- Completed V2/V3 Technical Support Document – OTC website July 2023
- 2023 (V1 & V2/V3) and 2026 (V2/V3) O₃ DVFs are available

Preliminary 2020-22 Design Values



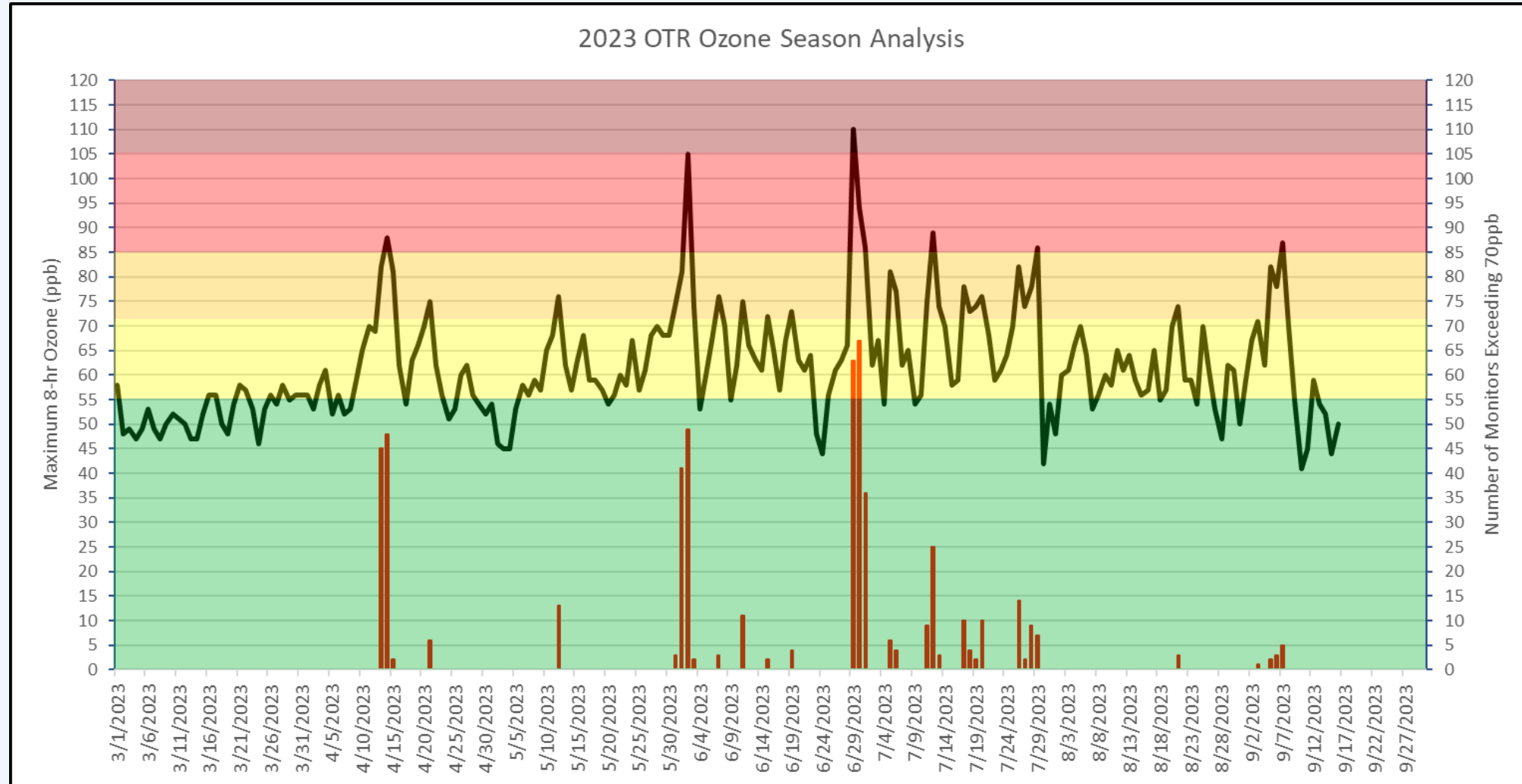
"2022 Ambient Ozone Concentrations - Relative to the 2008 and 2015 8-Hr Ozone NAAQS" – <https://experience.arcgis.com/experience/502feb600b32460caee6bbd10f8f4559/page/2015-O3-NAAQS---Prelim-DV/>



Data through October 2022
(Credit: Mark Prettyman and DE DNREC. Data available at <https://experience.arcgis.com/experience/502feb600b32460caee6bbd10f8f4559/page/2015-O3-NAAQS---Prelim-DV/>)

2023 OTR Statistical Information

- Highest 8-hour average 110 ppb at Essex, MD
- 150 sites have exceeded 70 ppb at least once (74 in 2022)
- 514 exceedances over 34 days
- 8 states + DC have had at least one day with Unhealthy AQI for O₃
- Greenwich, CT has had 14 exceedance days



Data prepared by Marcus Chase (NH DES) – data through 9/16/2023

Model-Projected 2023 V2/V3 Design Values

	2020-22	OTC V2/V3	OTC V2/V3	EPA V3
	Obs	CMAQ	CAMx	CAMx
Greenwich, CT	77	74.6	73.4	71.6
Danbury, CT	71	69.3	69.5	67.3
Stratford, CT	81	74.7	75.1	72.9
Westport, CT	80	76	75.6	73.3
Middletown, CT	73	69.6	70.5	68.7
Madison, CT	79	71.1	72.7	70.5
Groton, CT	72	71	67.8	65.5
Babylon, NY	74	67.7	68.5	66.2
Bristol, PA	72	70.2	71.6	67.9

Note: All 2023 design values computed with EPA's 3x3 "no water" method

Model-Projected 2026 V2/V3 Design Values

	2020-22	OTC V2/V3	OTC V2/V3	EPA V3
	Obs	CMAQ	CAMx	CAMx
Greenwich, CT	77	73.0	72.2	69.8
Danbury, CT	71	67.9	68.1	65.3
Stratford, CT	81	73.2	73.8	70.9
Westport, CT	80	74.6	74.2	71.3
Middletown, CT	73	68.0	69.0	66.5
Madison, CT	79	69.5	71.3	68.6
Groton, CT	72	70.9	66.5	63.7
Babylon, NY	74	66.4	67.4	64.6
Bristol, PA	72	68.7	70.3	65.8

Note: All 2026 design values computed with EPA's 3x3 "no water" method

O₃ Thresholds and Preliminary 2023 Design Values

	O ₃ threshold to meet the 2015 NAAQS	Preliminary 2021-2023 Design Value*
Greenwich, CT	58	79
Danbury, CT	67	73
Stratford, CT	46	82
Westport, CT	46	82
Middletown, CT	62	75
Madison, CT	54	79
Groton, CT	67	73
Babylon, NY	60	75
Bristol, PA	66	73

*Based on data through 9/16/2023 – includes days potentially impacted by wildfire smoke

Ongoing Initiatives

- Report out on HEDD modeling
- Report out on NO_x/VOC reductions across urban and nonattainment areas
- Track field campaigns in the region in 2023 – AEROMMA, CUPiDS, STAQS; as well as TEMPO satellite instrument
- Work with EPA, states, MJOs on next modeling platform – 2022 base year, with analytic years 2026, 2032, 2038 (V1 in 2024, V2 in 2025)
- Collaborate with SAS (e.g., electrification, ICI wood boilers) and MSC (e.g., EPA/CARB rules) to design episodic modeling scenarios

In-Progress Modeling Scenarios

Methods

- Modeling center leads: NY (emissions) & NJ (regional modeling)
- 12 km OTC domain
- Winter (January-February) and Summer (July-August) episodes

SAS-related scenarios – OTC states only?

- Zero-out ICI wood boilers
- Whole-home electrification based on ResStock analysis

MSC-related scenarios – OTC states? All states?

- Full implementation of EPA and/or CARB rules
- Anti-tampering

Possible New Initiatives

- Examine pollutant ratios (e.g., formaldehyde/NO₂ ratios) to characterize O₃ precursor limiting regimes
- Revisit/refine existing tagged contribution modeling to determine top control strategies (discussions with SAS and MSC)
- Closer look at key urban VOCs (e.g., solvents) and specific SCCs, by mass and reactivity
- Impacts of model boundary conditions on O₃ predictions in the OTR (new HAQAST Tiger Team)
- Continue testing new model versions and options (e.g., CRACMM)

Key Messages

- Regional modeling with the 2016 emissions platform has been completed
- Modeled O₃ design values are available for 2023 and 2026 analytic years
- Non-attainment is still an issue in the OTR, and cross-committee efforts to develop emission sensitivity tests are ongoing

Thank you!

Model Committee Chairs

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OTC Committee Lead

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Emissions Inventory Lead

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

O₃ Season Updates

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