

## AQRP Monthly Technical Report

<b>PROJECT TITLE</b>	Novel Observations and Quantified Source Apportionment of Ozone, Particulate Matter and Contributing Precursors in the El Paso Area	<b>PROJECT #</b>	24-024
<b>PROJECT PARTICIPANTS</b>	Pawel Misztal, Lea Hildebrandt-Ruiz, David Sullivan, Elena McDonald-Buller, Yosuke Kimura	<b>DATE SUBMITTED</b>	4/10/2025
<b>REPORTING PERIOD</b>	<b>From:</b> 3/1/2025 <b>To:</b> 3/31/2025	<b>REPORT #</b>	6

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15<sup>th</sup> of the month following the reporting period shown above.

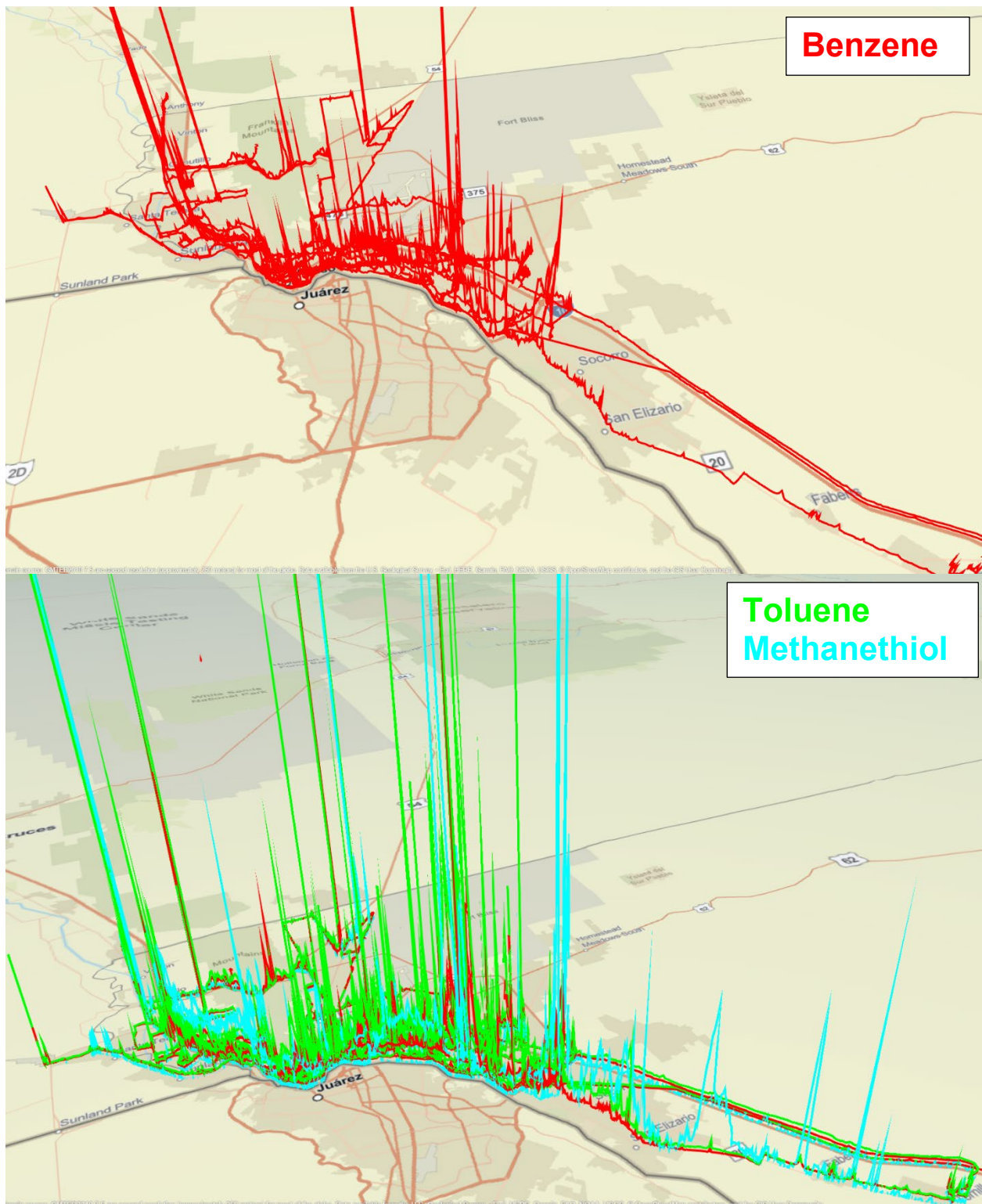
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### Detailed Accomplishments by Task for reporting period

**Task 2b:** The El Paso-Juarez Comprehensive Air Quality Model with Extensions (CAMx) basecase simulation is nearly completed; two months required modifications to the time stamp processing for the transition across the December spin-up period to January 2022 and are expected to finish at the Texas Advanced Computing Center (TACC) this week. Data post-processing and quality assurance assessments are ongoing for the ten months of the simulation that have completed.

Explicit simulation of ethylene oxide and toluene will require use of the Reactive Tracer (RTRAC) algorithm within CAMx. Ramboll had developed an RTRAC parameter file for ethylene oxide chemistry and deposition for use by Dr. Kimura and Dr. McDonald-Buller under an ongoing project for the U.S. Department of Energy (DOE), which will also be utilized for the El Paso-Juarez simulation. During March, Ramboll provided a similar file for toluene to be used in this AQRP study.

**Task 3:** Activities in March continued focusing on large data processing including data analysis from the High-Resolution Time of Flight Aerosol Mass Spectrometer (HR-TOF-AMS) and Vocus Proton Transfer Reaction Time of Flight Mass Spectrometer (Vocus-PTRTOFMS). The Vocus dataset has been processed and is now further calibrated and quantified. Volatile Organic Compound (VOC) calibration curves for each day are constructed to yield quantified concentration signals. Figure 1 shows visual representation of three example markers: benzene, toluene, and methanethiol. The graphs show spatiotemporal distribution of the relative abundances of these compounds. It demonstrates the extent of VOC measurements conducted and points to different locations of sources. For example, enhancements of odorous methanethiol were encountered near San Elizario where benzene and toluene were relatively low. In contrast, toluene and benzene were elevated as measured multiple times along the border. Further analysis of the wind directions and source apportionment will point to the exact sources and their categories.



**Figure 1.** A 3D representation of select VOC markers measured by the Vocus-PTRTOFMS, with benzene denoted in red, toluene in green, and methanethiol in cyan.

**Preliminary Analysis**

Yes

**Data Collected**

No

**Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments**

None

**Goals and Anticipated Issues for the Succeeding Reporting Period**

The modeling team expects that the El Paso-Juarez CAMx basecase simulation will be finished and quality assurance assessments and comparisons with ambient measurements will be conducted in April. Maps of percentile concentrations of carbon monoxide (CO), fine particulate matter (PM<sub>2.5</sub>), nitrogen oxides (NO<sub>x</sub>), ozone (O<sub>3</sub>), total volatile organic compounds (VOC), and sulfur dioxide (SO<sub>2</sub>) will be provided to the measurement team. The team also expects to work on implementation of the RTRAC algorithms for ethylene oxide and toluene simulations during April.

The measurement team is preparing the quantified observed VOC maps once the calibrations are applied and the nontargeted approach applied using the fit of explicitly calibrated sensitivity and proton transfer reaction coefficients. Similarly, the speciated PM data and source apportionment from the first campaign will be analyzed next. Finally, the stationary measurements collocated at different Texas Commission on Environmental Quality (TCEQ) and City of El Paso (CoEP) sites will be compared from the winter campaign.

The next intensive field campaign is currently planned for 5/12-5/21 (mobile) and 6/4-6/8 (stationary) at currently fully instrumented and operational University of Texas at El Paso (UTEP) monitoring site.

**Detailed Analysis of the Progress of the Task Order to Date**

None

**Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.**

Yes       No

**Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?**

Yes       No

**Do you have any bibliographic publications (ie: publications that cite the project) related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.**

Yes       No

**Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).**

Yes       No

**Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.**

Yes       No

**Have any personnel changes occurred that were not listed in the original proposal? If so, please include a detailed description of the personnel change(s) below.**

Yes       No

**Are any delays expected in the progress of the research? If so, please include a detailed description of the potential delay below.**

Yes       No

**Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.**

**Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?**

Yes       No

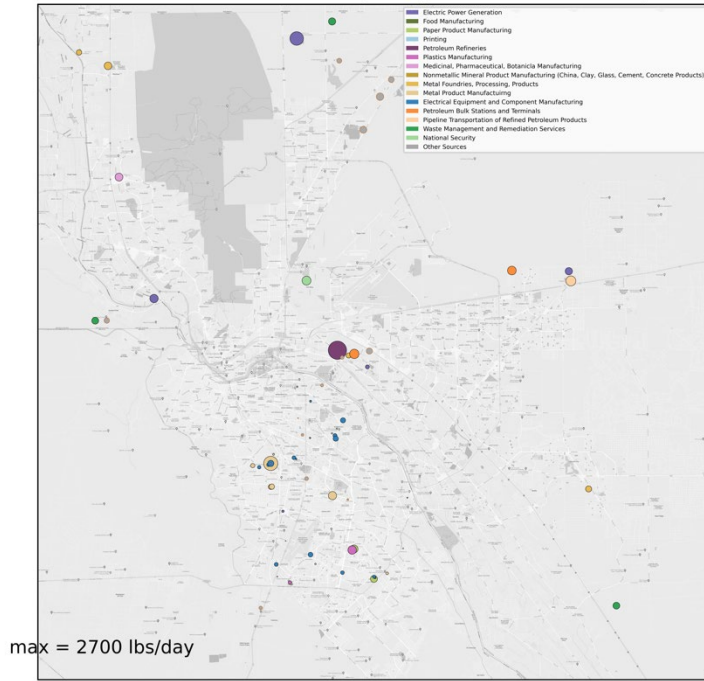
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Submitted to AQRP by  
Pawel Misztal

# Appendix Figure 1. Point Source Emissions by Industry Type for the El Paso-Juarez 4-km CAMx Domain

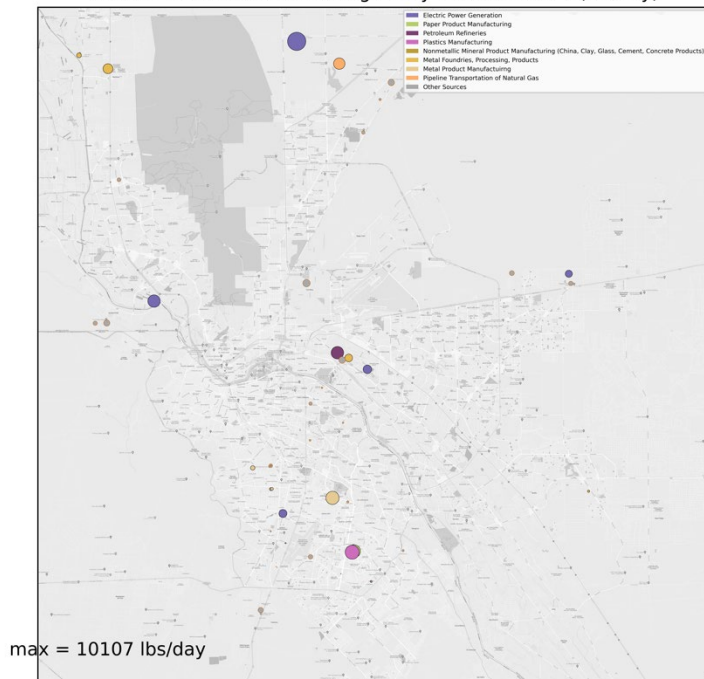
## (a) VOC

EPA NEI 2022v1 annual average daily VOC emissions (lbs/day)



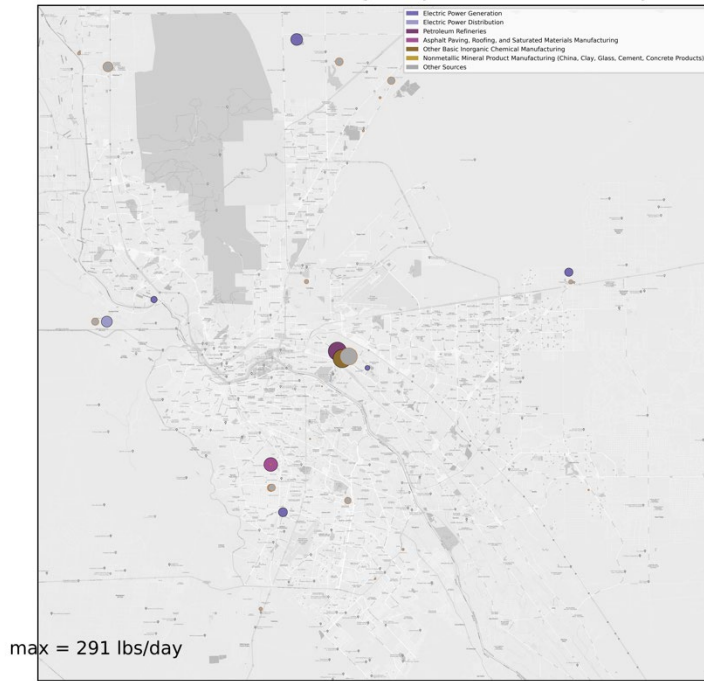
## (b) NOx

EPA NEI 2022v1 annual average daily NOx emissions (lbs/day)



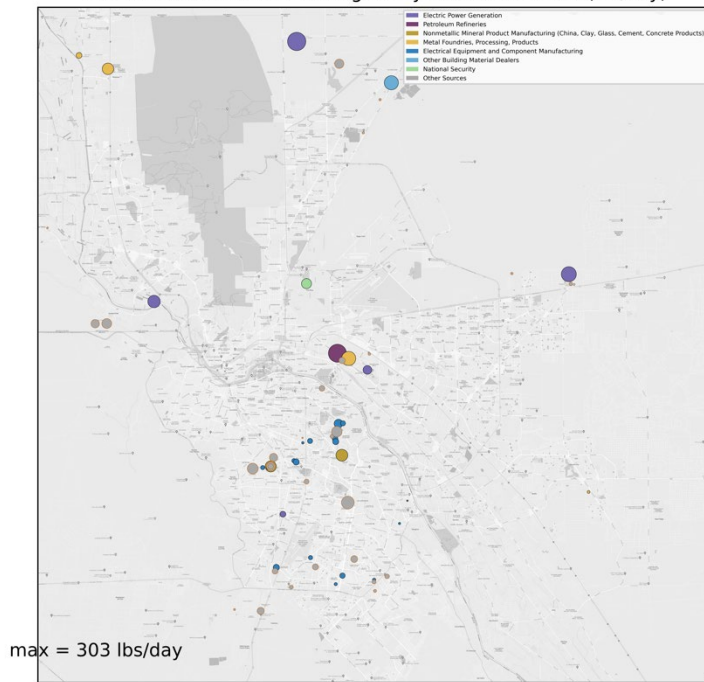
(c) SO<sub>2</sub>

EPA NEI 2022v1 annual average daily SO<sub>2</sub> emissions (lbs/day)



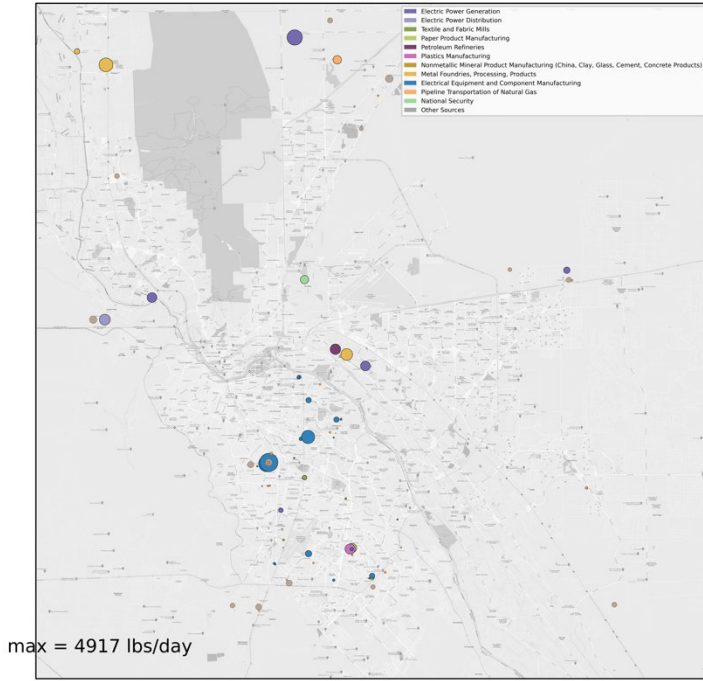
(d) PM<sub>2.5</sub>

EPA NEI 2022v1 annual average daily PM<sub>2.5</sub> emissions (lbs/day)



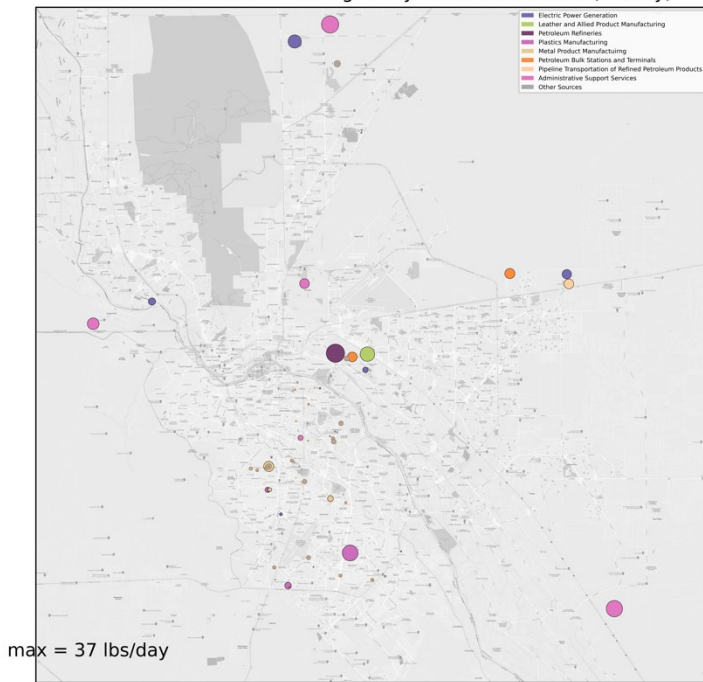
(e) CO

EPA NEI 2022v1 annual average daily CO emissions (lbs/day)

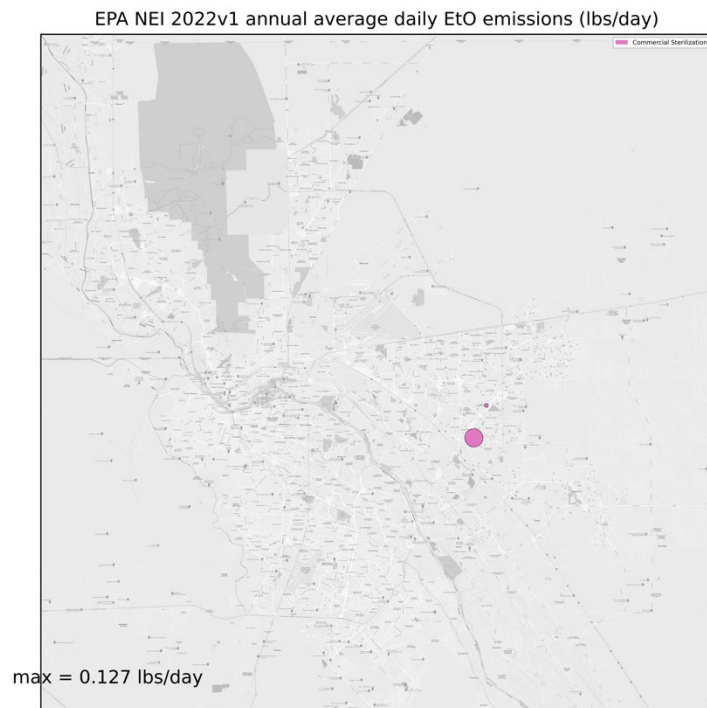


(f) Toluene

EPA NEI 2022v1 annual average daily Toluene emissions (lbs/day)



(g) Ethylene Oxide



**Appendix Figure 1.** Point Source Emissions by Industry Type for the El Paso-Juarez 4-km CAMx Domain