

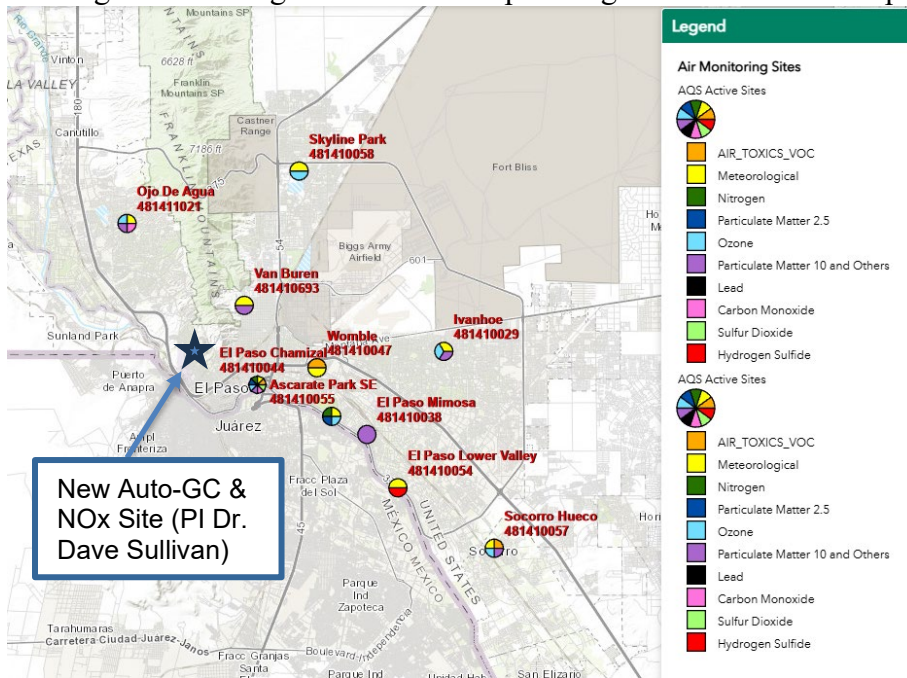
AQRP Monthly Technical Report

PROJECT TITLE	Novel Observations and Quantified Source Apportionment of Ozone, Particulate Matter and Contributing Precursors in the El Paso Area	PROJECT #	24-024
PROJECT PARTICIPANTS	Pawel Misztal, Lea Hildebrandt-Ruiz, David Sullivan, Elena McDonald-Buller, Yosuke Kimura	DATE SUBMITTED	12/10/2024
REPORTING PERIOD	From: Project Start To: 11/31/2024	REPORT #	1

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 15th of the month following the reporting period shown above.

Detailed Accomplishments by Task for reporting period

Task 1: Preparatory activities so far included familiarization with previous technical and final AQRP reports for El Paso (Valles 2021, 2023, Ramboll 2021) and relevant recent papers (e.g. Karle et al., 2021). The discussions and meetings among the PIs and the AQRP program manager happened during the kick-off meeting which took place on 11/5. During the kick-off meeting the modeling and observation planning activities have been preliminarily discussed and



further input from TCEQ/AQRP will be collected in a broader meeting planned for the week 11/18. Dr. Sullivan described the fenced site (Fig. 1) which is being discussed for collocating the UT Mobile Van. The approach will combine exploratory tracks within a 50-mile radius as well as high density focused tracks guided by CAMx. Colocation activities are planned near the TCEQ stations.

Figure 1. TCEQ & City of El Paso air monitoring stations with the new Auto-GC & NOx station denoted with a star. <https://tceq.maps.arcgis.com/apps/webappviewer/index.htm>

The UT team met with TCEQ representatives on Tuesday Dec 3. The plans for observational intensive measurements and modeling have been presented and discussed. Among others it has been agreed about the importance of wind direction for capturing relevant plumes. To inform the field campaigns and to understand the variability of chemical constituents, we performed wind direction and speed analyses at the available TCEQ and City of El Paso air monitoring locations. These stations are distributed as shown in Figure 2, along the US – Mexico border, inside the city and to the north. Additional UT station with speciated VOCs by auto-GC, NO_x, and met will be installed NW of UTEP site.

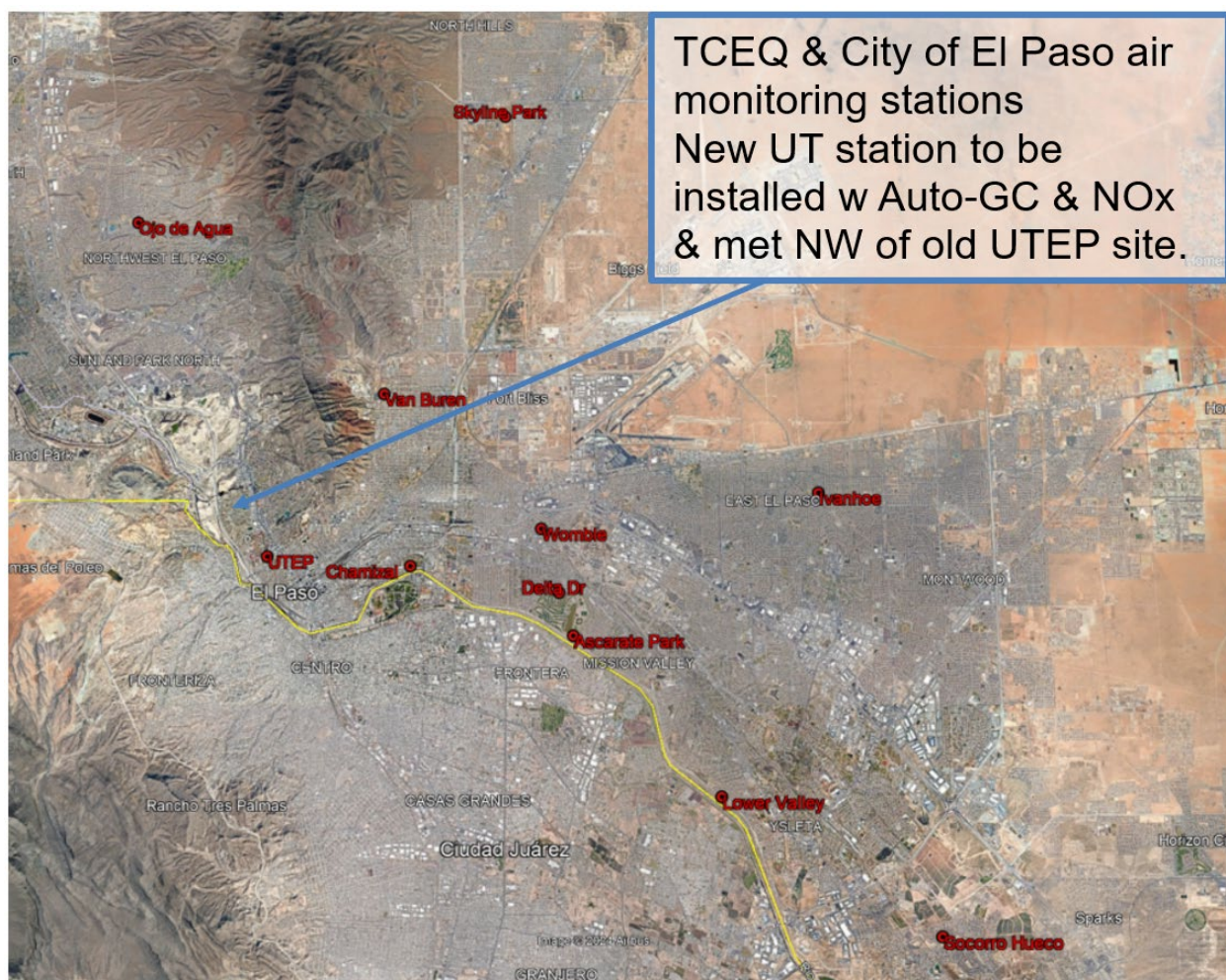


Figure 2. TCEQ & City of El Paso air monitoring stations. New UT Station to be installed w/auto-GC, NO_x and met, NW of old UTEP site.

As shown by the annual windroses from these monitoring stations (Figure 3), the wind patterns are somewhat variable with the dominant westerly and easterly prevailing winds in the stations along the US-Mexico border and with northerly and southerly components increasing towards East El Paso and North Hills. These patterns allow for optimizing the mobile measurements to maximize measurements of plumes from Mexico as well as from sources situated in the El Paso metropolitan area.

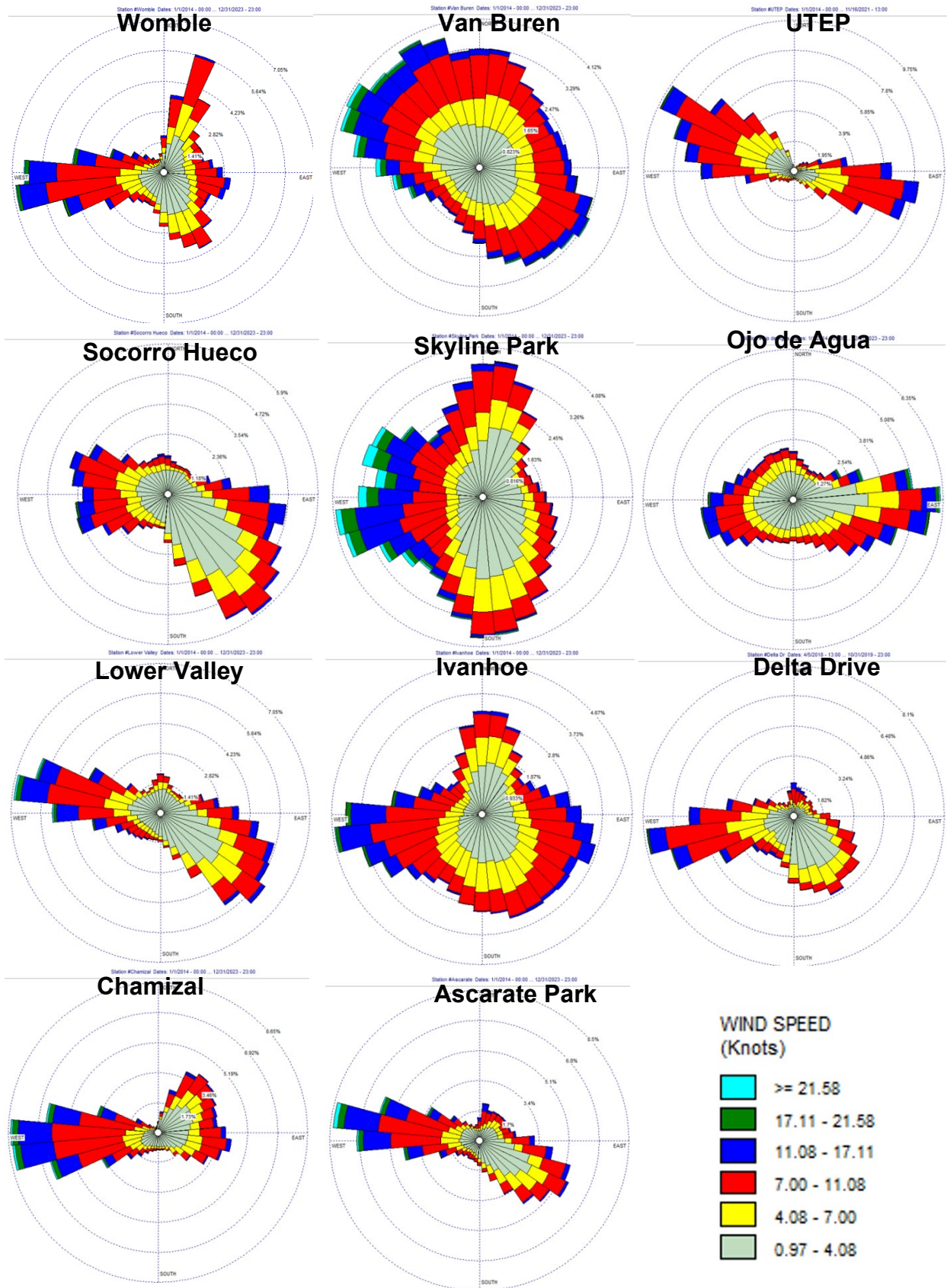


Figure 3. Windroses at 11 TCEQ and City of El Paso monitoring stations.

Design of the mobile tracks. The goal of the mobile measurements is to enhance understanding of the sources in El Paso, both local and foreign. Coinciding with westerly winds one of the tracks goes along the border and conducts switchbacks in the community areas downwind. During easterly winds a track that ventures deep in the city towards the industrial sources modeled by CAMx within its domain. Some of the tracks will optimize the colocation opportunities with TCEQ stations where the van will stop by for 10 minutes at different times of the day. The tracks are currently being designed and optimized and will be completed before the field campaign. The suggestions can be made by creating a new layer directly on mymaps.google.com ([LINK](#)). The current plan is to drive on January 3 for a 2-week winter field campaign and in May (exact date TBD). The initial plan was to colocate the van overnight for charging at the UT site but due to electrical challenges we are also considering staying at RV parks (e.g. Rio Grande RV park, or El Paso West RV park) which are equipped in 50 A power for charging the van and to run instruments in the stationary mode.

Task 2b: After discussions with the TCEQ (Wiening Zhao), the plans for the El Paso-Juarez Comprehensive Air Quality Model with Extensions (CAMx) platform were revised. The CAMx configuration for the region will now leverage the US Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS) 2022 modeling platform (<https://registry.opendata.aws/epa-2022-modeling-platform/>). This annual episode includes meteorological fields from the Weather Research and Forecasting Model (v4.4.2) with 12-km resolution over CONUS and emissions from the EPA 2022v1 emissions modeling platform (<https://www.epa.gov/air-emissions-modeling/2022v1-emissions-modeling-platform>). The updated CAMx domain and horizontal grid configurations are shown in Figure 4. The outer West Texas domain will be windowed and three-dimensional boundary conditions will be obtained from the 12-km CONUS simulation. The inner flexi-nested horizontal grid will have 4-km resolution with an innermost grid with 1-km resolution over El Paso-Juarez. The modeling team is currently processing emissions from the EPA 2022v1 inventory at 1-km resolution for the entire 4-km domain as a high priority for the observation team.

Preliminary Analysis

None

Data Collected

None

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

None

Goals and Anticipated Issues for the Succeeding Reporting Period

The observation team is working on finalizing the mobile tracks and anchor points for charging the van's batteries and taking stationary measurements while the van is not moving. While some routes can be designed after conducting exploratory drives, the tracks and the waypoints can guide the optimal use of time and collection of useful spatiotemporal data.

The modeling team aims to produce quarterly emissions maps for nitrogen oxides (NO_x), total volatile organic compounds (VOC), sulfur dioxide (SO₂), fine particulate matter (PM_{2.5}), toluene, and ethylene oxide (EtO).

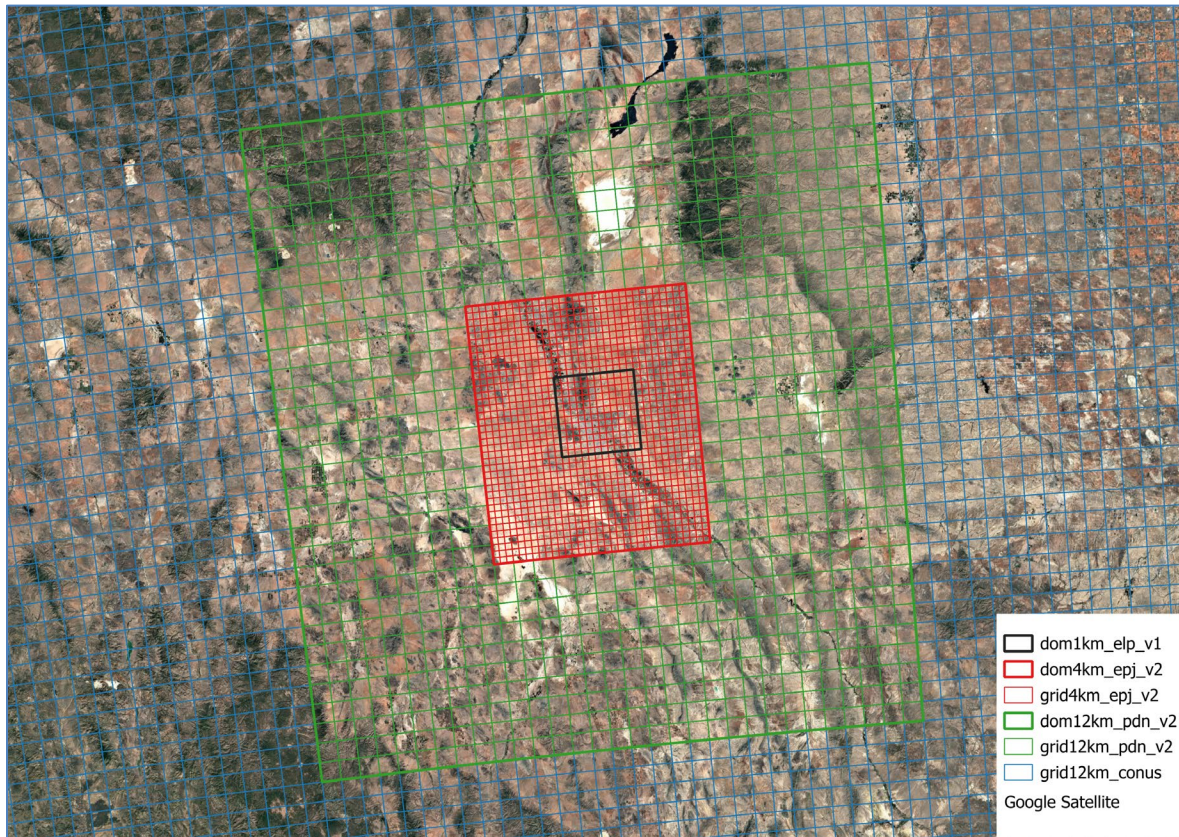


Figure 4. Proposed 12-km West Texas domain (green) with 4-km nested domain (red) and 1-km El Paso-Juarez innermost domain (black). The 12-km West Texas domain will be windowed from the existing 12-km CONUS grid of the EPA OAQPS 2022 modeling platform (blue).

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

Submitted to AQRP by
Pawel Misztal