AQRP Monthly Technical Report

PROJECT TITLE	**Improving the Modeling of Wildfire Impacts on Ozone and Particulate Matter for Texas Air Quality Planning**	**PROJECT #**	AQRP 17-024
PROJECT PARTICIPANTS	Matthew Alvarado (AER) Chantelle Lonsdale (AER) Christopher Brodowski (AER)	**DATE SUBMITTED**	01/09/2017
REPORTING PERIOD	**From:** 12/01/2016 **To:** 12/31/2016	**REPORT #**	3

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

Task 1: Develop improved parameterization and assess the impact on Texas air quality

In this reporting period we began incorporating fire emissions into the CAMx model via the plume-in-grid module, but this work is still on-going.

Task 2: Investigate the impact of long-range transport of BB pollution on Texas air quality

In this period we analyzed the CO mixing ratios along the outer boundary of the 36-km CAMx/GEOS-Chem model grid for the May and June 2012 TCEQ modeling episodes. Regions with CO concentration >= 120 ppbv are currently being down-selected to those episodes likely to be due to biomass burning emissions entering the domain for further analysis. This was first done by examining each edge of the GEOS-Chem boundary grid and calculating the total number of 3-hour observations exceeding the 120 ppbv threshold for each day. Figure 1 shows the example results for May 2012.

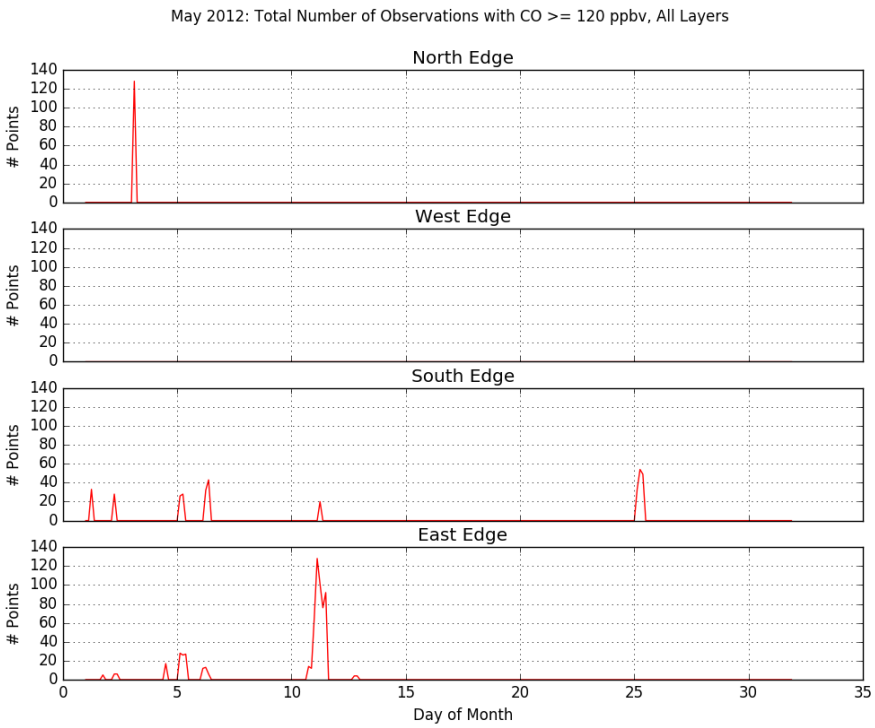

Figure 1: Number of 3-hour observations exceeding 120 ppbv CO for each edge of the 36-km GEOS-Chem boundary grid for May 2012.

May 2, 3, 5, 7, 11, 12, and 25 were selected for further investigation, along with June 9, 10, 14, 15 and 30. In order to determine whether or not remote wildfires impacted the grid, the STILT model was then run for a selection of cases in order to determine the 1-week air flow history for the city of Austin, as shown in Figure 2:

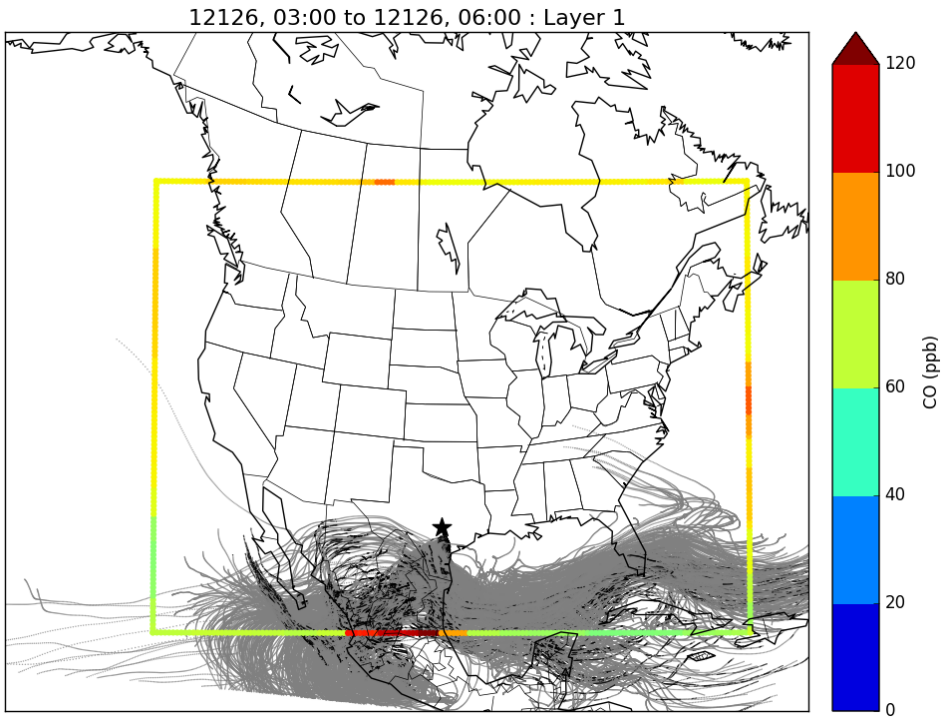

Figure 2: STILT run for May 5th, 2012 for the Austin, TX site. Note the southerly flow, indicating the possibility that wildfires in Mexico may impact the Austin site.

This process will continue until approximately 5 days are selected for STILT-ASP runs.

Preliminary Analysis See the accomplishments under Task 2 described above.

Data Collected None.

Identify Problems or Issues Encountered and Proposed Solutions or Adjustments

Nothing to report

Goals and Anticipated Issues for the Succeeding Reporting Period

Task 1:

- Continue adding fires to the CAMx simulations via the Plume-in-Grid module
- Begin running BBOP plume simulations.

Task 2:

- Use STILT back-trajectory runs to evaluate the contribution of fires to the observed CO during episodes where biomass burning emissions impacted the boundary conditions.

Detailed Analysis of the Progress of the Task Order to Date

As of the end of this reporting period, the following milestones have been completed for each task:

Task 1:

- Coupling of SAM-ASP completed
- Preliminary runs and evaluation against Alvarado et al. (2015) completed, revisions of SAM-ASP based on these results on-going
- Verified that our CAMx simulation can reproduce the 2012 TCEQ modeling episode

Task 2:

- Examination of boundary condition files for potential episodes of biomass burning influence on-going.
- STILT runs for these episodes ongoing.

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 __X_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 __X_No

Do you have any bibliographic publications 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 __X_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 __X_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.

__X_Yes ___No

Lonsdale, C. R., C. Brodowski, M. Alvarado, J. Henderson, J. R. Pierce, and J. Lin (2016), Regional Modeling of Biomass-Burning Aerosol Impacts, Abstract GC51E-1225, presented at the 2016 AGU Fall Meeting, San Francisco, CA, Dec. 12-16.

Submitted to AQRP by Matthew J. Alvarado (AER)

Principal Investigator Matthew J. Alvarado (AER)