AQRP Monthly Technical Report

PROJECT TITLE	Apportioning the Sources of Ozone Production during the San Antonio Field Study	PROJECT #	19-025
PROJECT PARTICIPANTS	Aerodyne Research, Inc.	DATE SUBMITTED	July 8, 2019
REPORTING PERIOD	From: June 1, 2019 To: June 30, 2019	REPORT #	7

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: High-Resolution (HR) Analysis

High-resolution analysis has been completed for the I-CIMS dataset, and these results have been incorporated into subsequent tasks like PMF analysis. A two-day period from Floresville is still being analyzed.

Task 2: PMF Analysis

PMF calculations are ongoing, with some preliminary results shown below. The final PMF results with include the 2-day I-CIMS period that is currently being re-analyzed in Task 1. Initial PMF results incorporating the GC-ToF data are shown below.

Task 3: 0D Box Model

The GC-ToF dataset has been mined to produce select ratios of chemical tracers. These ratios are currently being incorporated into the 0D model to ensure realistic defaults get used in the simulations. Gaps in the GC-ToF dataset are being addressed by using VOC-to-small-molecule ratios determine during periods with good overlap between GC-ToF and TILDAs, VOCUS, or I-CIMS datasets.

Task 4: Back-Trajectory Footprint Analysis

A more complete Hysplit footprint dataset (with better spatial resolution and covering the entire SAFS timespan) has been used in a footprint overlap analysis with different Texas land use types. Categories of land use were also modified versus the preliminary analysis in order to separate vegetation types including oak (a strong isoprene emitter), and to include the impact of all oil and gas plays in the measurement domain (including, for example, the Barnett shale play).

Preliminary Analysis

PMF analysis was performed on the GC-ToF, PTR and TILDAS data, with results shown below.
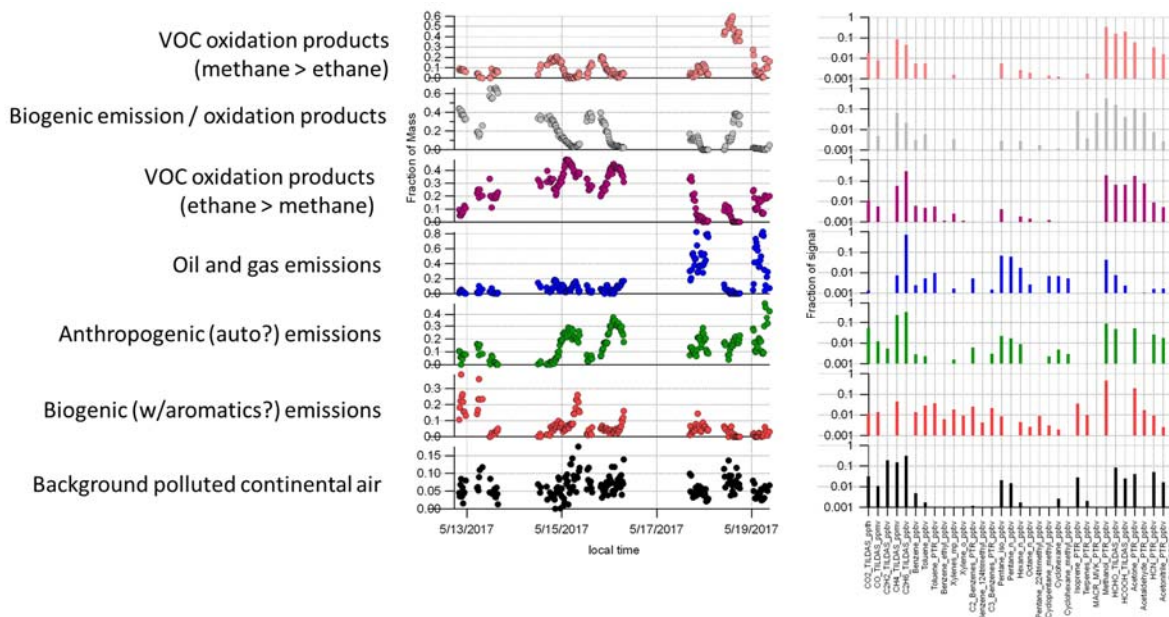
The time series associated with these factors is shown below, for the periods in San Antonio and Floresville (transport to Floresville was on 5/17/2017):
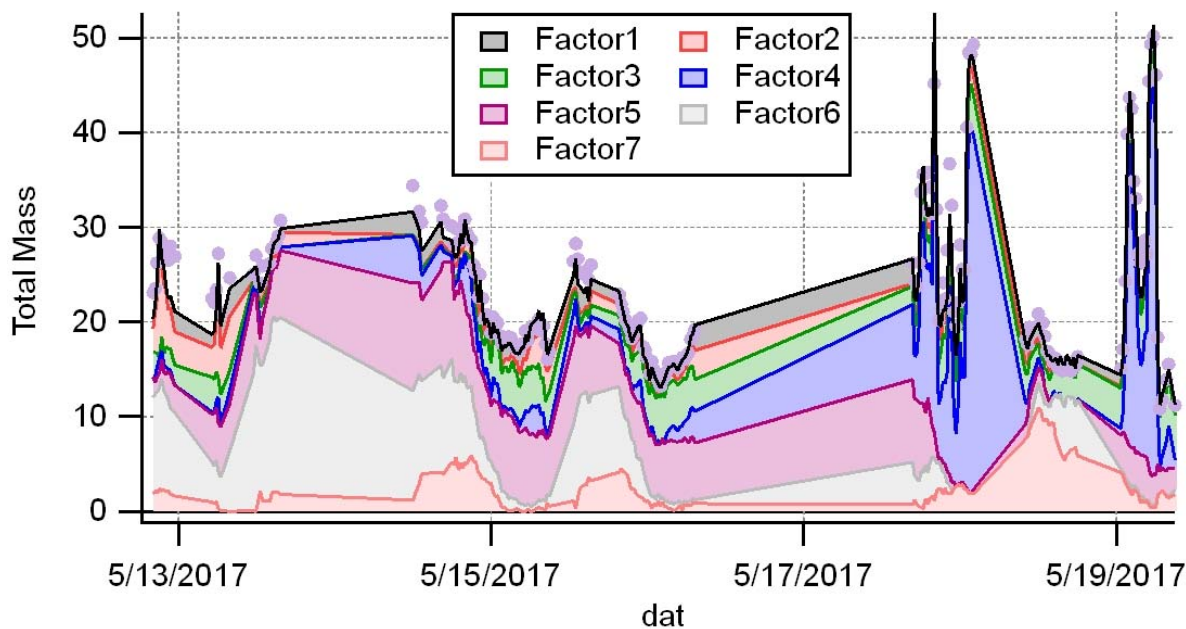
Notably, the time series shows that factors 5 and 6 – VOC oxidation products and biogenic emissions and oxidation products – dominate in San Antonio, while factor 4 – oil and gas emissions – play a major role in Floresville. This information will play a role in the 0D box modelling, to understand the role of these factors in the ozone production of these regions.

Data Collected

No data will be collected as part of this project. However, data will be generated after completion of Task 1, HR analysis.

Identify Problems or Issues Encountered and Proposed Solutions or Adjustments

No specific issues have come up in the most recent reporting period.

Goals and Anticipated Issues for the Succeeding Reporting Period

In the next reporting period, there are several goals:

- Task 1: Finalize dataset, including calibrations and removal of bad time periods.
- Task 2: Continue correlation of PMF data to other tracers and time series.
- Tasks 1 and 2: Continue with peak identification efforts on PTR-ToF and I-CIMS data using results from Task 2. Include other existing SAFS data to help in identification (e.g. isoprene). This task will be ongoing through the next few reporting periods.
- Task 3: Incorporate additional real measurement data and/or ratios of tracers into the 0D model.
- All Tasks: Tailor work towards answering main project goals and filling in the final report outline

No issues are anticipated.

Detailed Analysis of the Progress of the Task Order to Date

Management of the project, including reporting responsibilities, has been transitioned over to Dr. Roscioli as Dr. Yacovitch takes leave. This was done following the procedures laid out in the contract, and with full approval of AQRP management.

Progress continues on all tasks. Tasks 1 and 2 have seen major progress as the high-resolution fit results from the I-CIMS instrument have been analyzed.

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.

___Yes   _X_No

Submitted to AQRP by   Dr. Rob Roscioli

Principal Investigator