

AQRP Monthly Technical Report

PROJECT TITLE	Characterization of Corpus Christi and San Antonio Air Quality During the 2020 Ozone Season	PROJECT #	20-003
PROJECT PARTICIPANTS	Robert Griffin, Rice James Flynn and Yuxuan Wang, UH Rebecca Sheesley and Sascha Usenko, Baylor	DATE SUBMITTED	9 April 2021
REPORTING PERIOD	From: 1 March 2021 To: 31 March 2021	REPORT #	8

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

Work performed in this month was related to Task #1, campaign preparation. Significant effort was made toward finalizing the trailer and the installation of equipment and instrumentation for the field deployment, which was scheduled for April 2021. Much of this work was performed at Baylor in the early part of March. The trailer was driven to Houston around mid-to-late March to help support the installation of the trace gas instrumentation and the high-resolution time-of-flight aerosol mass spectrometer (HR-TOF-AMS). Specific tasks completed include:

- Installation of pumps and pump box on the roof of the trailer
- Installation of the ceilometer, sky camera and global positioning system on the roof of the trailer
- Construction of the trace gas inlet box collocated with photolysis and meteorological sensor
- Checking and labeling of all electrical outlets
- Installation of the tower
- Installation of the heated proton-transfer reaction mass spectrometer (PTR-MS) inlet
- Construction and installation of the aerosol and trace gas inlets and ensured usability for both stationary and mobile measurements
- Confirmation of the flowrates for the aerosol instrumentation
- Building and installation of the adjustable table for the HR-TOF-AMS (also installed)
- Installation of the PTR-MS with calibration and cryotrap system
- Installation of local network with dual SIM router with marine cellular signal booster to improve connectivity in areas of weak signal
- Calibration of all instrumentation upon installation

Expendable supply purchases continued, as did training of staff and graduate students on all instruments. Drive planning for week 3 (mobile measurements based in Corpus Christi after the initial 2-week stationary period) continued; these drives will focus on characterization of both

local emissions and downwind transformations. Issues associated with planned routes (e.g., low bridges) were identified.

Additional work was performed for Task #3, data analysis, which includes three-dimensional modeling. This includes continued implementation of larger-scale GEOS-Chem outputs as boundary conditions to drive the WRF-GC model and preparing emission files for the fine-resolution WRF-GC runs to be performed as part of this project. This work is a continuation of that reported last month.

Preliminary Analysis

None yet

Data Collected

None yet

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

As referenced in the first five monthly reports, delays in finalizing task orders and issues associated with the COVID pandemic have necessitated shifting the field work from fall 2020 to spring 2021. With approval from the AQRP, we have adjusted and added to the scientific questions to be addressed using our field data analysis and modeling. Note that a few individuals from the Baylor group were forced to quarantine due to potential exposure to COVID-19. This has resulted in some delays, but the group worked diligently to catch up. There also were delays caused by the winter storm that hit Texas in mid-February, preventing access to laboratories for essentially a week. The teams again worked hard to make up for that lost time. Baylor also experienced delays in receiving equipment and supplies: the most noticeable was the tower (3 weeks delay), TAPs (2 weeks delay), and PTR-MS heated sampling line (3 weeks delay). These delays were a result of COVID-related logistic hurdles (personnel communication with vendors). The team members worked extremely hard to be ready to deploy to the field as of April 1, which will be discussed during the next monthly report.

The NO/NO_x zero volume temperature controller malfunctioned on 3/30, damaging the heaters. A spare temperature controller was installed but the heater damage was too significant to safely operate. The instrument will zero more frequently and leave the heaters off during this project to mitigate these effects. The heater set point is only ~10C over ambient, and after discussions with the instrument manufacturer, the team feels that this is an acceptable solution.

Goals and Anticipated Issues for the Succeeding Reporting Period

Model: Continue generation of appropriate input files for three-dimensional modeling efforts, continued training of researchers on use of the three-dimensional model

Field: Deployment as of April 1 and collection of the first month of data.

Detailed Analysis of the Progress of the Task Order to Date

Given the late start and the approved change in project field work, we believe that our progress on the project has been appropriate.

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

See response above regarding problems encountered. This is more a shift in timing as it will not impact our ability to complete the project by the scheduled end date, assuming no further delays associated with COVID-19.

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

None not addressed previously.

**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 Robert J. Griffin