

AQRP Monthly Technical Report

PROJECT TITLE	<i>Evaluating the Ability of Statistical and Photochemical Models to Capture the Impacts of Biomass Burning Smoke on Urban Air Quality in Texas</i>	PROJECT #	22-003
PROJECT PARTICIPANTS	Matthew Alvarado, Jen Hegarty, Rick Pernak	DATE SUBMITTED	01-10-2022
REPORTING PERIOD	From: December 1, 2022 To: December 31, 2022	REPORT #	5

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

During this reporting period we have been developing python scripts to project the NOAA Hazard Mapping System (HMS) smoke polygons for 2012 – 2021 to the GOES CONUS grid **for Task 1: Using GAMs to Quantify Urban Smoke Impacts and Deliverable 1 Q3 Compile meteorological and fire predictors into a single dataset (Task 1)**. The scripts will produce hourly files of 2-km gridded smoke density data. In this initial step we will use the density data to determine a binary flag indicating that smoke occurred (1) or didn't occur (0) over the selected Houston and El Paso monitoring locations during a given day. The flags will be incorporated into the Generalized Additive Models (GAMs) as predictors.

Continued STILT footprint modeling.

Preliminary Analysis

None to date.

Data Collected

None to date.

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

The HMS to GOES scripts have many python package dependencies. We discovered that it is critical to start with a “clean” conda environment and install all the necessary packages at once for the installation to work properly. It is also recommended to install all of the packages from the same repository to avoid incompatibilities. We have documented this process and will include this information with the code delivered to TCEQ upon completion of this project.

Goals and Anticipated Issues for the Succeeding Reporting Period

In the next reporting period, we will work to complete testing of the HMS smoke polygon to GOES gridded smoke density script and initial testing of the GAMs updated with the binary smoke flag.

Detailed Analysis of the Progress of the Task Order to Date

Completed initial drafts of Work Plan and QAPP. Held project kickoff. Started work on STILT analyses and gathering data for GAMM studies.

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.

None

**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
Matthew J. Alvarado