AQRP Monthly Technical Report

PROJECT TITLE	A synthesis study of the role of mesoscale and synoptic-scale wind on the concentrations of ozone and its precursors in Houston	**PROJECT #**	18-010
PROJECT PARTICIPANTS	Qi Ying, John Nielsen-Gammon	**DATE SUBMITTED**	6/13/2019
REPORTING PERIOD	**From:** 5/1/2019 **To:** 5/31/2019	**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

Task 1: Synthesis of mesoscale wind structures in the synoptic-scale context
In May, we focused on implementing techniques for automatically isolating the diurnal wind cycle from time-varying background winds. Previous analyses had operated on a somewhat different format of profiler data and had treated the background winds as static. This new implementation will separately identify the mean background wind, the gradual evolution in background wind over time, and the diurnal winds forced by the sea breeze and the low-level jet. By the end of May, we were had just about completed the code-writing stage and were about to embark on the development stage. At the beginning of June, a Ph.D. student will join our research team. His expertise is in WRF modeling, and he will focus on model setup, parameterization configuration, and meteorological validation.

Task 3: Analysis of the interaction of mesoscale winds and ozone formation during key episodes
No progress were made regarding this we are waiting for recommendations of additional ozone episode to model.

Preliminary Analysis

Data Collected

No additional data were collected during this period.

Identify Problems or Issues Encountered and Proposed Solutions or Adjustments
None to report.

Goals and Anticipated Issues for the Succeeding Reporting Period

The 2D atmospheric age distribution plot is a powerful tool to analyze the time evaluation of O3 and its precursors. We will continue to do more data analysis with this tool. We plan to run the 12-km simulations to refine the model results. We will also report modeling preparation for other ozone episodes when such periods are identified.

Detailed Analysis of the Progress of the Task Order to Date

Task 2 (source and age resolved model development) has been completed. Task 1 is currently on-going with all necessary data retrieved. Task 3 is on-going for the year 2000 with good results. We believe that sufficient progress has been made in order to complete the project on time.

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.

_X__Yes ___No

We are working on a manuscript with a preliminary title "Improve the computation efficiency of source-oriented chemical mechanisms for the source apportionment of secondary gaseous and particulate pollutants", which we plan to submit to Atmospheric Environment.

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 Qi Ying, on May 20, 2018.

Principal Investigator