

# AQRP Monthly Technical Report

<b>PROJECT TITLE</b>	Refining ammonia emissions using inverse modeling and satellite observations over Texas and the Gulf of Mexico and investigating its effect on fine particulate matter	<b>PROJECT #</b>	22-019
<b>PROJECT PARTICIPANTS</b>	University of Houston	<b>DATE SUBMITTED</b>	4/10/23
<b>REPORTING PERIOD</b>	<b>From:</b> March 01, 2023 <b>To:</b> March 31, 2023	<b>REPORT #</b>	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 15<sup>th</sup> of the month following the reporting period shown above.

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## Detailed Accomplishments by Task for the reporting period

### Task1: Preparation of comprehensive satellite, in situ, and modeling data for the iterative Finite Difference Mass Balance (iFDMB) method:

No activities during the reporting period.

### Task2: Development of the Reduced-Complexity CMAQ Model (RCCM) for NH<sub>3</sub> and refinement of NH<sub>3</sub> emissions using iFDMB with the combination of the CMAQ model and CrIS satellite observations:

The UH-AQF modeling team produced offline files over the modeling domain for 2019, and we are working on running iFDMB with the Cross-track Infrared Sounder (CrIS) over the domain. There is an issue regarding the availability of CrIS data from March 25 to August 12, 2019.

### Task3: Investigation of PM<sub>2.5</sub> concentrations using the updated emission inventory:

The UH-AQF modeling team ran the Community Multiscale Air Quality (CMAQ) model over the modeling domain for 2019 using a priori emissions. We are investigating the effect of a priori NH<sub>3</sub> emissions on inorganic fine particulate matter (PM<sub>2.5</sub>) over Texas and the Gulf of Mexico.

### **Preliminary Analysis**

None during the reporting period.

### **Data Collected**

None during the reporting period.

### **Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments**

We have an issue regarding the availability of CrIS data from March 25 to August 12, 2019. It seems that the CrIS observations on the Suomi National Polar-Orbiting Partnership (SNPP) for the period are not available because of some issues in the sensor. For the missing data, the CrIS data provider was supposed to provide the CrIS observations from National Oceanic and Atmospheric Administration-20 (NOAA-20). But it is not uploaded yet. We are in contact with them to ensure we have the missing data.

We have two alternatives if the missing data are not provided: 1. using the Infrared Atmospheric Sounding Interferometer (IASI) satellite when the CrIS data are unavailable. 2. switching from 2019 to 2018 or 2017 when all data are available.

### **Goals and Anticipated Issues for the Succeeding Reporting Period**

The UH-AQF team will continue working on resolving the issue and running the iFDMB over Texas and the Gulf of Mexico.

### **Detailed Analysis of the Progress of the Task Order to Date**

None during the reporting period.

**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.**

**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

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Submitted to AQRP by  
Yunsoo Choi