

AQRP Monthly Technical Report

PROJECT TITLE	New Satellite Tools to Evaluate Emission Inventories: Is a 3-D Model Necessary?	PROJECT #	20-020
PROJECT PARTICIPANTS	University of Wisconsin – Madison Ramboll	DATE SUBMITTED	7/12/2021
REPORTING PERIOD	From: June 1, 2020 To: June 30, 2020	REPORT #	12

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, work was carried out on Tasks 1 – 3 and 5.

Task 1: Simulate NO₂ and SO₂ amounts with the high-resolution WRF-CAMx model

Ramboll completed evaluation of model performance at surface monitors for the final CAMx simulation. Ramboll also delivered CAMx model concentrations and emissions to the UW-Madison team.

Task 2. Compare model simulations with TROPOMI and near-surface observations

In order to investigate the possibility of a best practice in calculating model column amounts for comparison with satellite observations, the UW-Madison team has evaluated both the 12km and 4km CAMx simulations with TROPOMI NO₂ using different methodologies for calculating model column amounts.

Task 3. Compare satellite data and emissions for power plants and urban areas

The UW-Madison team is continuing work on the direct comparison of satellite observations of NO₂ with emissions and model column NO₂ amounts, with the comparison for three cities complete. For consistency across the project, the UW-Madison team is using the same spatial definition of the urban areas of interest as Dr. Daniel Goldberg used for his analysis.

Task 5. Project Reporting and Presentations

The UW-Madison team, Ramboll, and Dr. Daniel Goldberg have started a draft Final Report.

Dr. Daniel Goldberg has completed making publication-ready figures and outlined the publication that he will lead with collaboration from the UW-Madison and Ramboll teams. The UW-Madison team will lead a second manuscript, which is being prepared.

Preliminary Analysis

None.

Data Collected

None.

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

None.

Goals and Anticipated Issues for the Succeeding Reporting Period

All teams will contribute to the final report and presentation.

Detailed Analysis of the Progress of the Task Order to Date

None.

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

Two manuscripts are being prepared:

- (1) working title, “*Evaluating the NO_x emissions and ozone production sensitivities in Texas using TROPOMI NO₂ and HCHO,*” planned submission to Atmospheric Chemistry and Physics
- (2) working title, “Three Ways of Using Satellite Data to Quantify Emissions”, planned submission to Environmental Manager

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

This change has been submitted by the University of Wisconsin—Madison Office of Research and Sponsored Programs. Here it is informally summarized: Originally, we had budgeted for a communications person to play a role in documenting project outcomes throughout the project. As work has progressed, there has been more satellite data analysis required, conducted by Dr. Dan Goldberg (contractor working for Ramboll) and by Dr. Monica Harkey (scientist at UW). To address these needs we have requested:

- * Decreasing UW salary and fringe by \$5K and spend \$5K to hire Dan Goldberg as a UW contractor, increasing Dr. Goldberg's total commitment to the project to about \$15K (~\$10K Ramboll; \$5K UW)
- * Internally rebudget within UW to increase Dr. Harkey's time on the project
- * A science communications person would still be involved to write an article for EM and assist with the final report, but this would be a lower fraction of the budget.

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 Tracey Holloway

Principal Investigator

Tracey Holloway