

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	2/8/2021
REPORTING PERIOD	From: January 1, 2020 To: January 31, 2020	REPORT #	7

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 Task 1 and Task 2.

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

The Ramboll modeling team prepared and completed two CAMx sensitivity simulations that modify the MEGAN biogenic emissions and are designed to help improve NO₂ and ozone model performance.

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

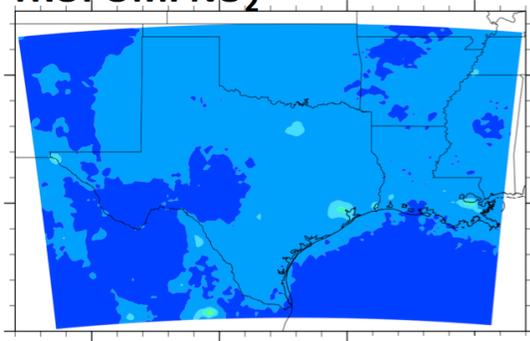
The Ramboll modeling team completed evaluation of WRF-CAMx results against TCEQ observations for the base simulation and two sensitivity simulations.

The UW-Madison is continuing with processing of TROPOMI NO₂ with WHIPS on the 12km domain and processing of CAMx column amounts with the TROPOMI averaging kernel. The UW-Madison team completed updating WHIPS to a newer version of Python, has installed WHIPS on an additional machine for faster processing, and has commenced gridding of TROPOMI NO₂ to the 4km domain.

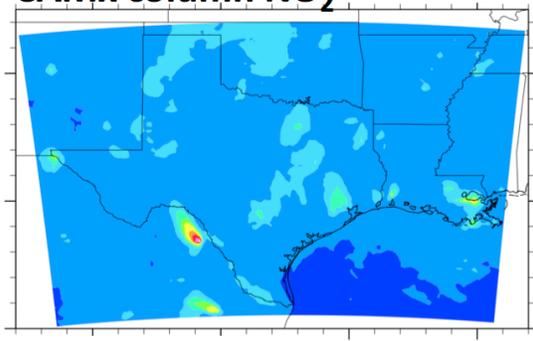
Preliminary Analysis

The UW-Madison team is continuing analyses to support comparison of TROPOMI NO₂ with CAMx output. An example of the latter is shown below using one month of TROPOMI and CAMx data.

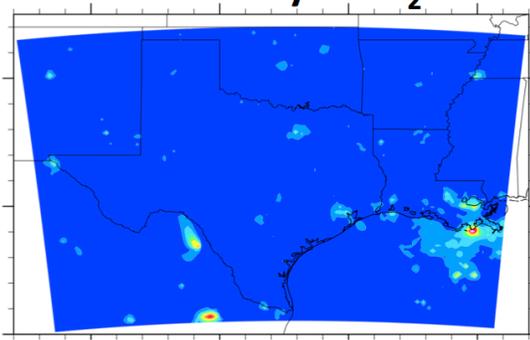
TROPOMI NO₂



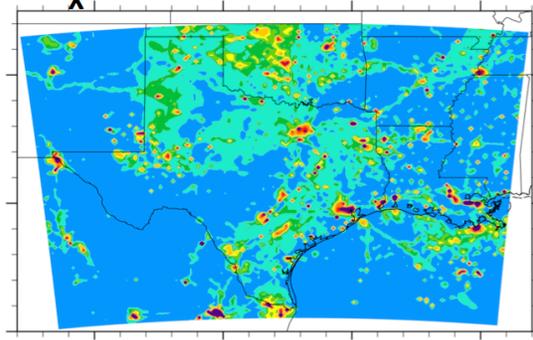
CAMx column NO₂



CAMx surface layer NO₂



NO_x emissions



July 2019 average TROPOMI and CAMx NO₂ column amounts (top left and right, respectively), CAMx surface layer NO₂ (bottom left) and total NO_x emissions (bottom right).

Data Collected

None.

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

None.

Goals and Anticipated Issues for the Succeeding Reporting Period

Ramboll will perform additional sensitivity simulations, pending evaluation against observations. In addition, Ramboll will assist UW-Madison with comparison of satellite data with emissions from power plants and mobile sources.

UW-Madison will continue gridding TROPOMI NO₂ to the 12km and 4 km model domains via WHIPS. As more gridded TROPOMI are available, the UW-Madison team will continue comparison of model and satellite column NO₂.

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

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 Tracey Holloway

Principal Investigator Tracey Holloway