

Satellite Data at Georgia EPD as a Decision-Making Tool

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HAQAST Showcase
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Georgia EPD's Current Projects Using Satellite Data

- **Exceedance Reports**

- Since 2016, Georgia EPD has written detailed reports for every exceedance of the NAAQS.
 - INITIAL REPORT: Must be completed within 2-3 business days after the exceedance.
 - FINAL REPORT: Submitted after all relevant information has been collected. This could be days, weeks, or months.
- Reports include discussions on meteorology, emissions (e.g., [satellite detected fires](#)), smoke plume movements (e.g., [GOES16 true color images](#)), and air quality (e.g., [TROPOMI NO₂ VCD](#)).

- **Exceptional Event Demonstrations**

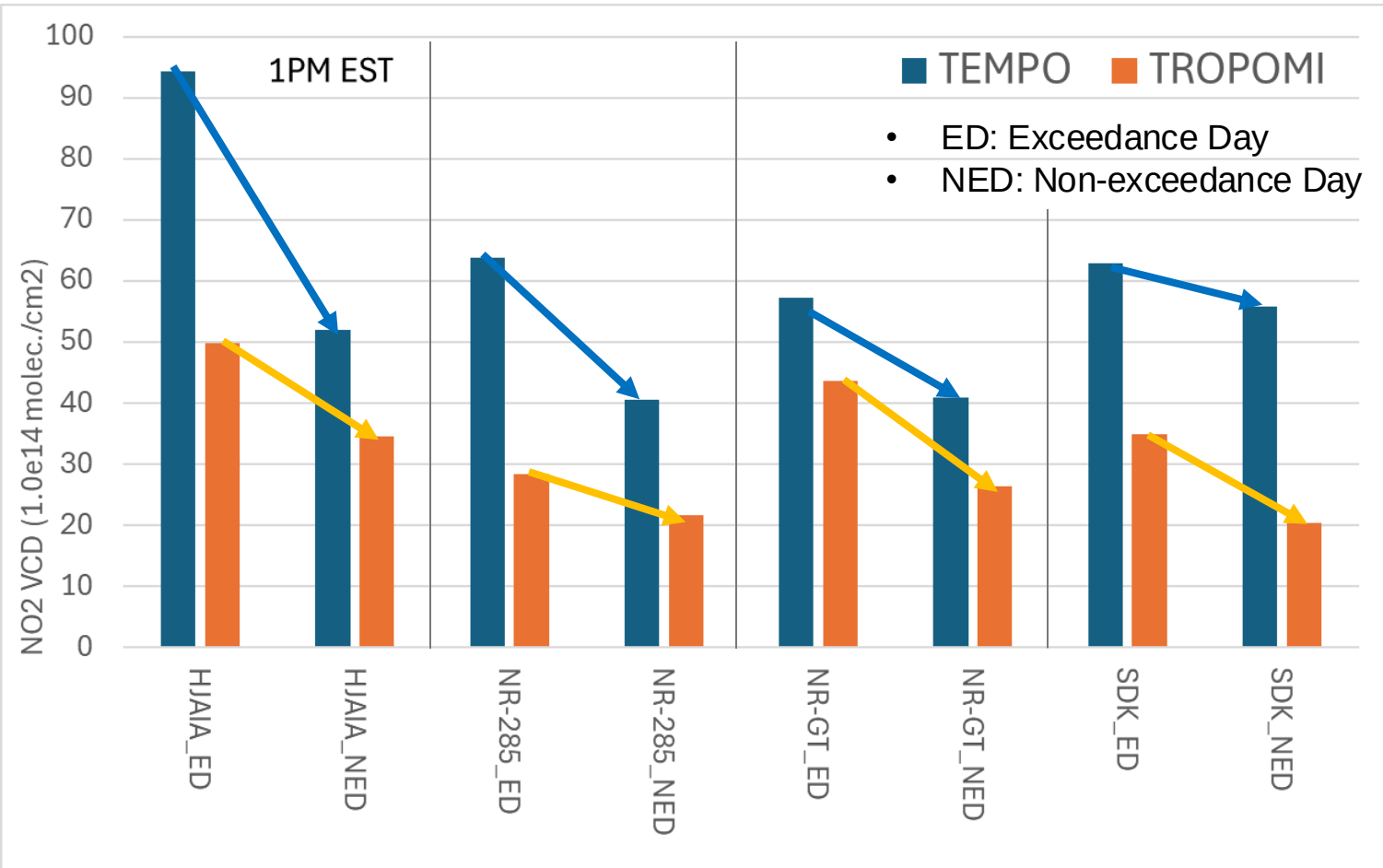
- Exclusion of data for the purpose of calculating design values: “Clear Causal Relationship”
 - The same approach can be used for data screening to develop PM_{2.5} background concentration to support permit modeling.

- **Network Assessment**

Georgia EPD started using OMI satellite data back in 2016 for its final ozone exceedance report. OMI data helped us confirm a long-term declining trend of NOx emissions and identify what to look for. Since then, the upper management of Georgia EPD has been very supportive of utilizing satellite products in air quality analysis to support its air quality management.



NO₂ VCD : TEMPO vs TROPOMI (June and July 2024)



NO₂ VCDs: ED>NED

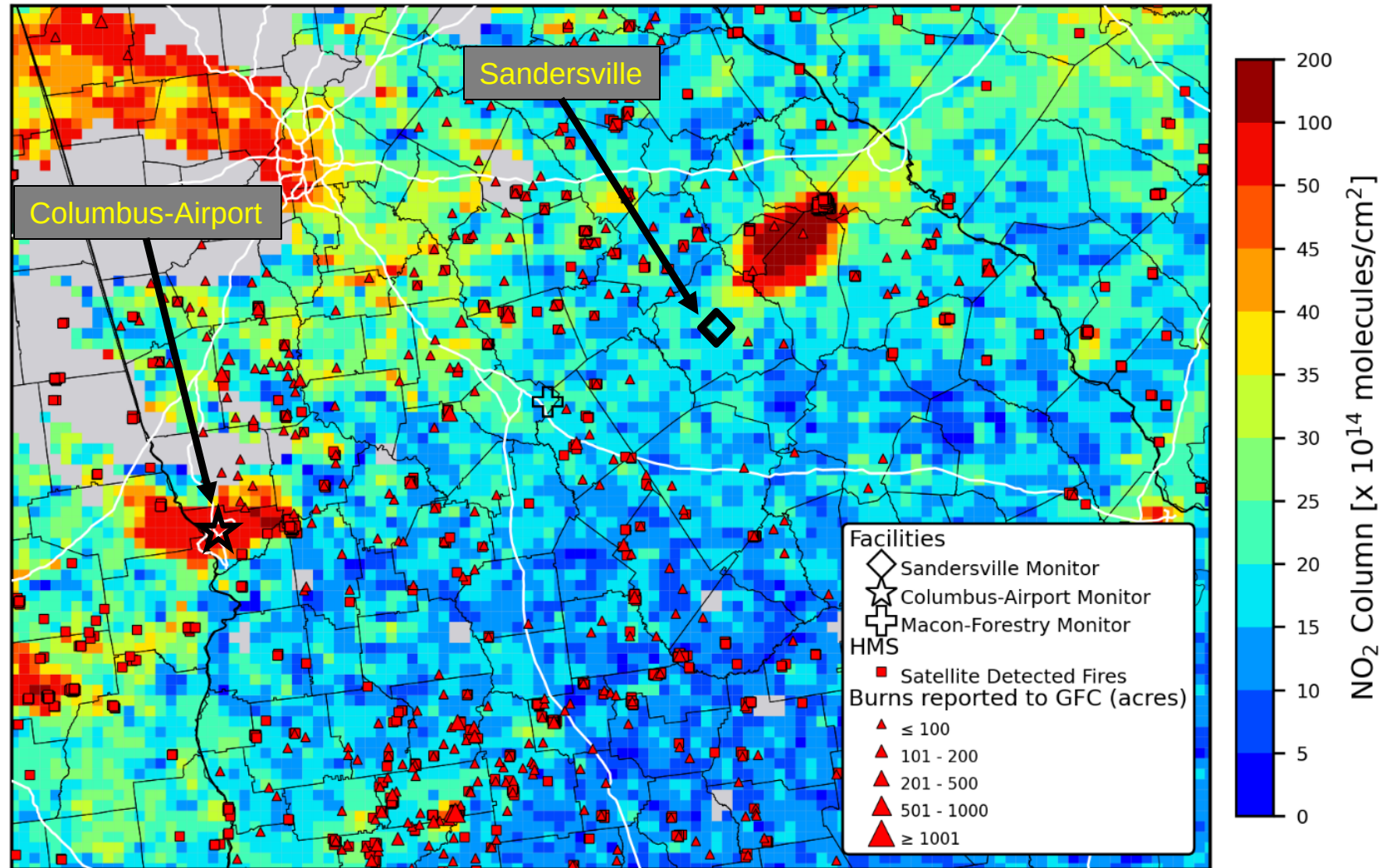
More Analysis Underway

- Comparison of satellites with PANDORA
- Comparison of PANDORA with ground monitors (e.g., “Near ATL” data from Dr. Kaiser at Georgia Tech)



Columbus-Airport and Sandersville: March 8, 2023

2023-03-08



1:30 PM EST

Georgia EPD developed a Python code to create these plots using EPA's RSIG3D data.



GOES16 Animation - March 8, 2023

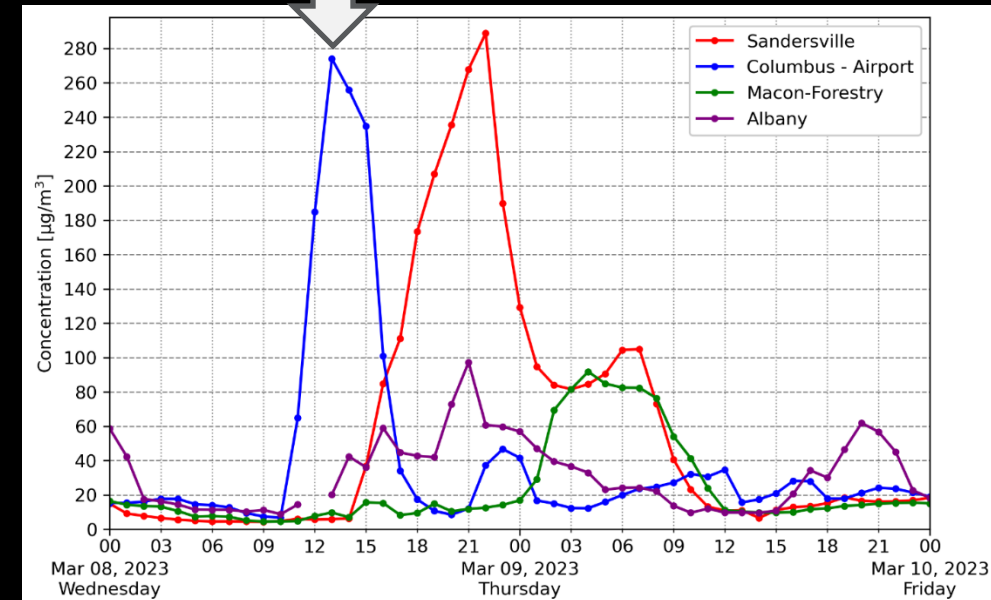
Columbus-Airport



1:00 PM EST

Images from SLIDER by RAMMB/CIRA@CSU (<https://rammb-slider.cira.colostate.edu/>)

Georgia EPD is currently working with NOAA to generate these figures for past events on Georgia EPD's in-house modeling server.

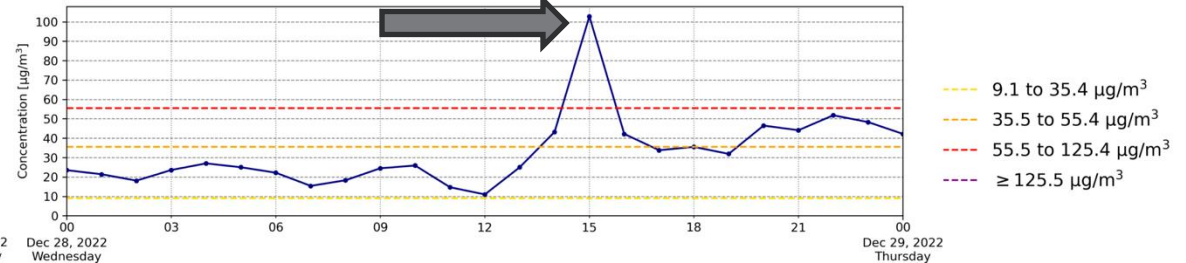
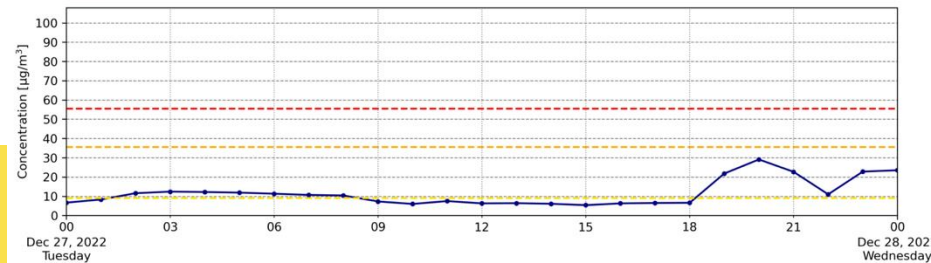
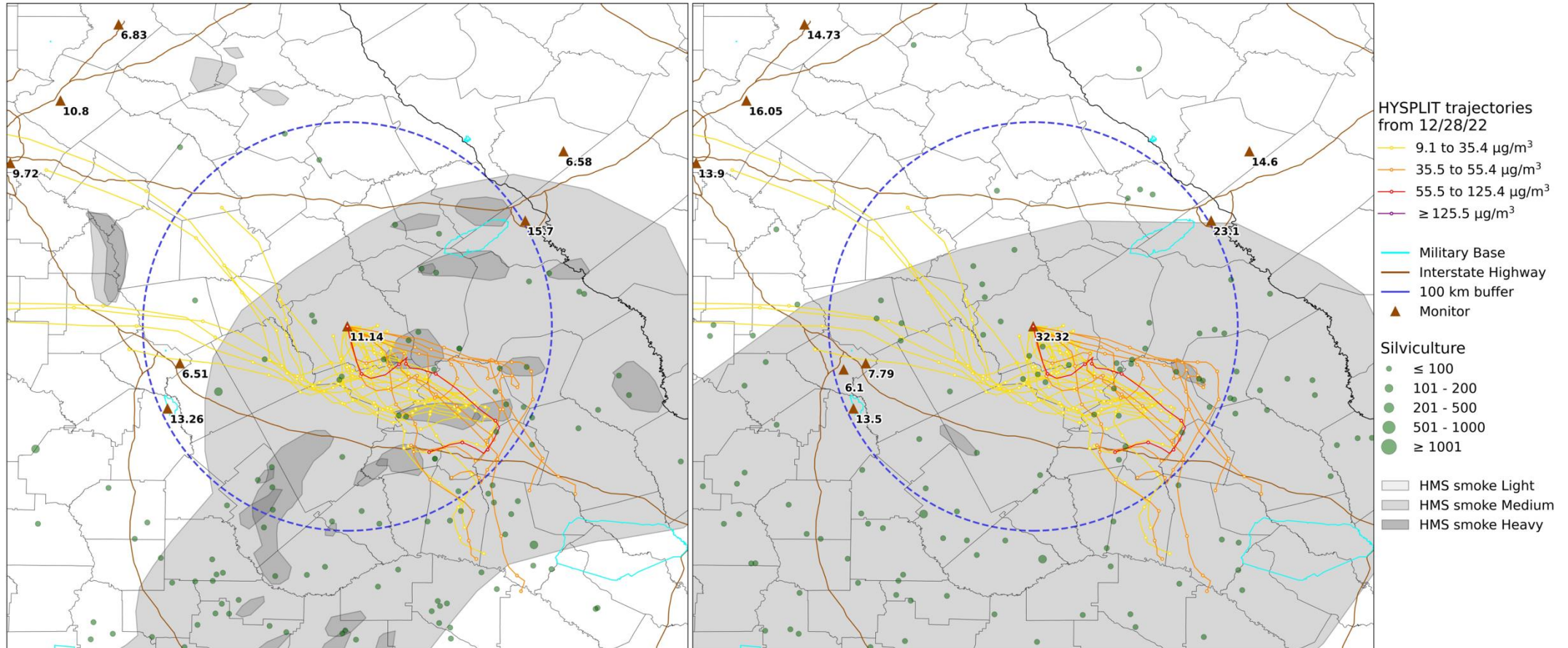




Data Screening Analysis for Exceptional Event Demo

Sandersville on 20221227

Sandersville on 20221228



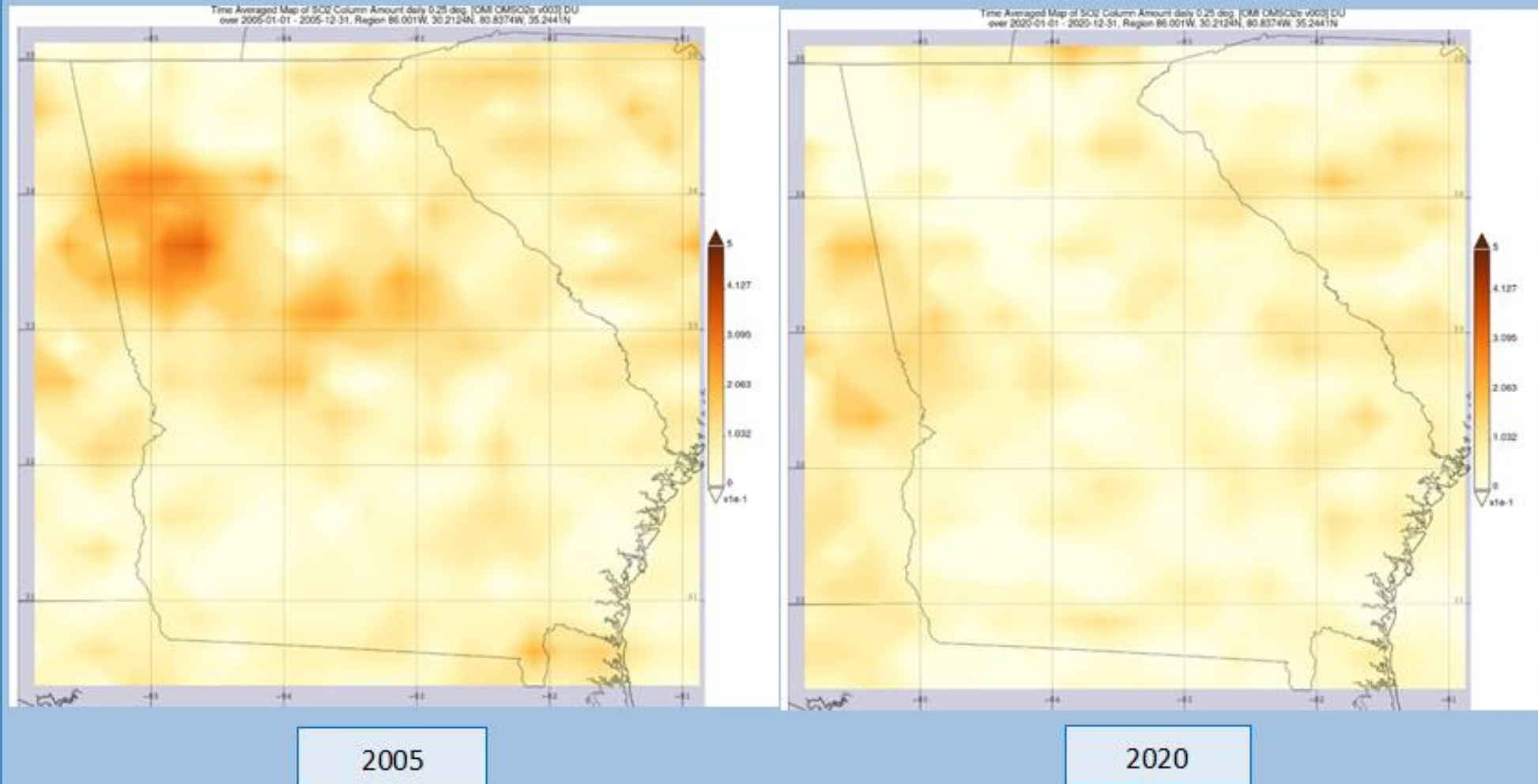
Georgia EPD developed a Python code to create these plots.



Long-Term SO₂ Changes: Ambient Monitoring Program's Annual Report

Statewide SO₂ Concentration Comparison from 2005 to 2020

- Figure 21 compares the concentrations of sulfur dioxide from 2005 and 2020 in Georgia on a scale of 0 to 5 in Dobson units (DU)⁵.
- These maps were created by NASA using satellite data and depict averages of sulfur dioxide concentrations over the eastern United States.





HAQAST Partnerships Have Helped Georgia EPD...

- Understand fundamentals of satellite observations;
- Acknowledge strengths and weaknesses of satellite data when these data are applied for air quality management;
- Find various trainings (e.g., NASA ARSET) and programs (e.g., TEMPO Early Adaptor Program)
- Acquire mission-critical skills to process satellite data;
- Provide various HAQAST Tiger Teams (TTs) with our inputs;
- Have opportunities to share our thoughts on the use of satellite data for Georgia's air quality management with satellite communities as a stakeholder; and,
- Connect with satellite experts including HAQAST Ambassadors.

Travel Stipend Award has been extremely helpful for us to meet HAQAST teams, fellow air agency folks, and satellite experts in person.

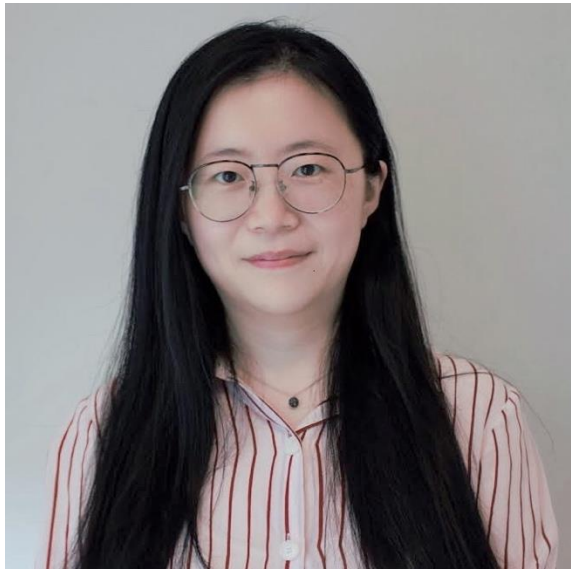


HAQAST Partnerships Have Helped Georgia EPD...

Most importantly, build capacities to utilize satellite data!



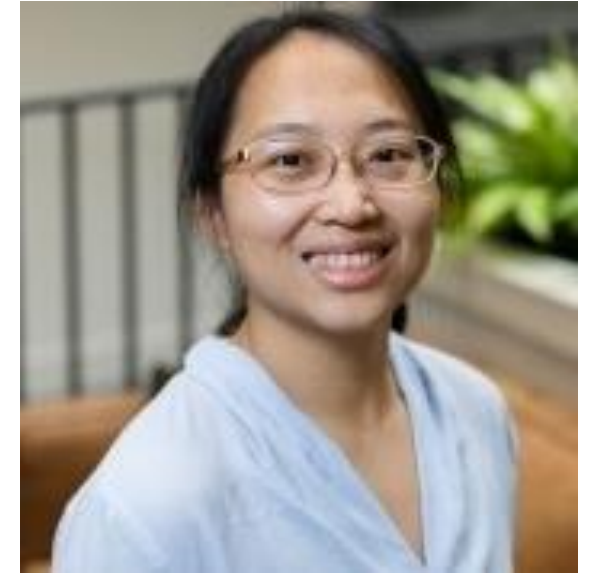
Dr. Byeong-Uk Kim has supported modelers at Georgia EPD for their use of satellite data. He has been a HAQAST Ambassador since June 2022.



Dr. Xiangyu Jiang has led development of exceedance reports and contributed to Georgia EPD's exceptional event demonstrations with satellite data.



Dr. Asher Mouat has worked on exceptional event demonstrations and will analyze air quality in the State of Georgia including analyses on exceedances with satellite data.



Dr. Ziqi Gao used satellite data and developed various tools to investigate exceedances during her tenure at GA EPD. Dr. Gao is now with University of Virginia.

In addition, connection and collaboration with research groups in the state (Drs. Russell, Odman, Hu, and Kaiser at Georgia Tech and Dr. Liu at Emory) through the HAQAST program have been a vital part of our efforts to enhance our capacities. Thank you!



Contact Information

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Questions?

