

# Advances in Supporting Air Quality Management Needs

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Georgia Institute of Technology



HAQAST Showcase  
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# Several organizations and people have contributed to this work. These are a few:

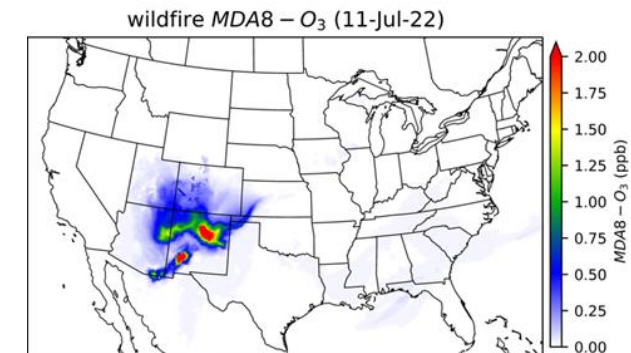
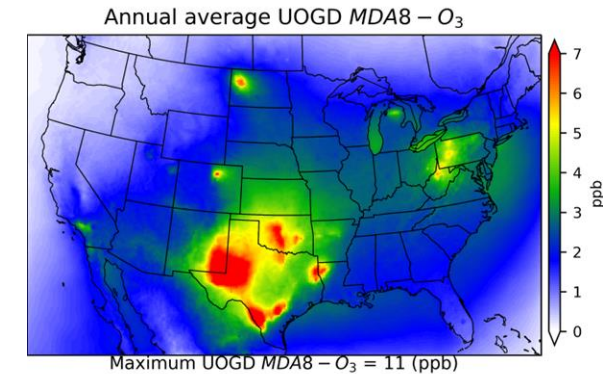
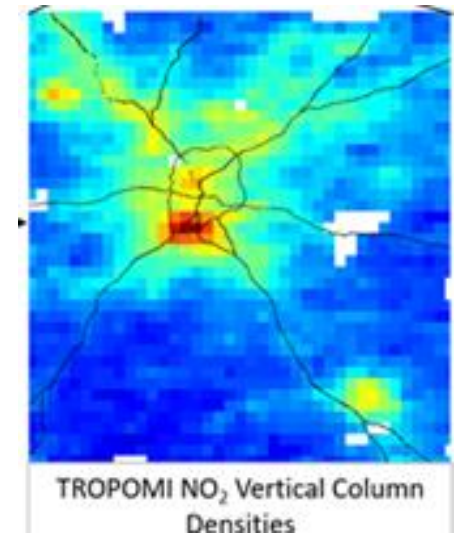
Tiger Teams, Rapid Response, and other outside organizations we have had the pleasure of working with on this team



Opinions are those of the presenter. Views expressed do not necessarily represent the views of any of the organizations above

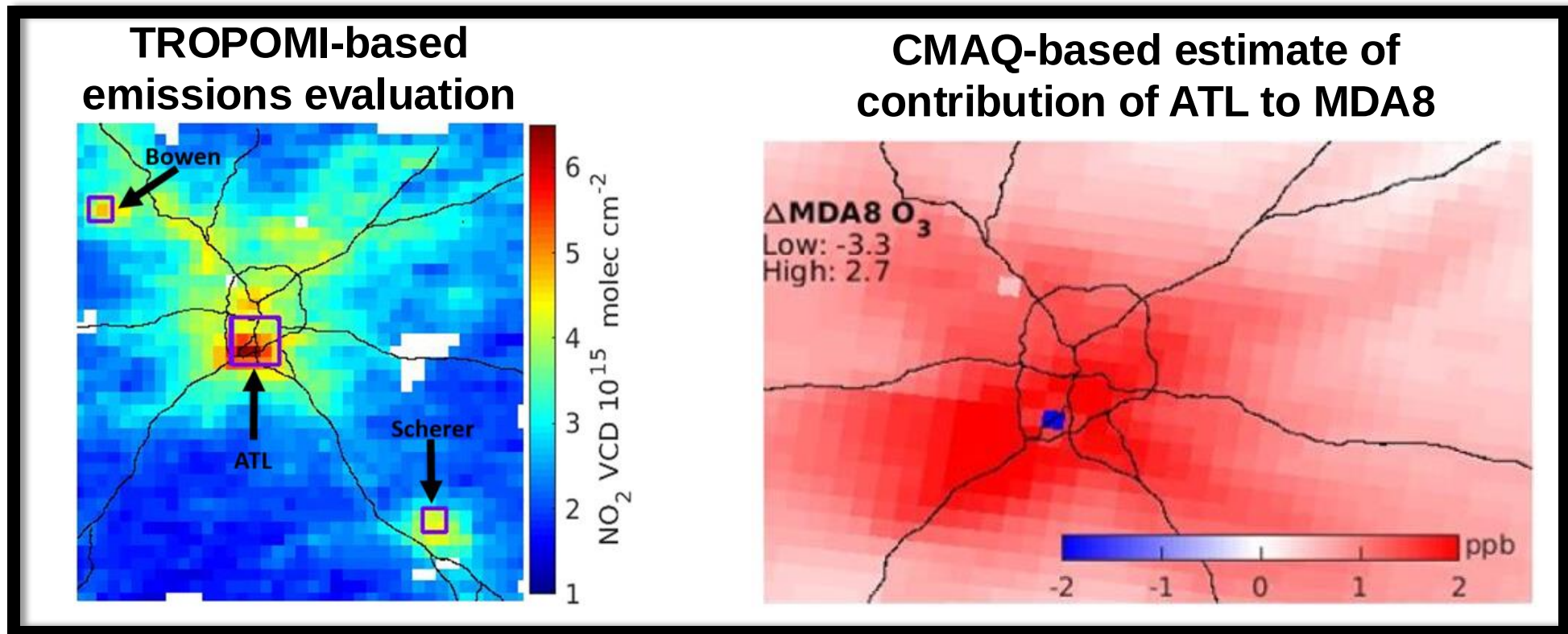
# Projects enabled by HAQAST

- Base Project: Port-related emissions
- Tiger Teams
  - Oil and gas operations
  - TEMPO ozone
  - Boundary conditions
  - Emissions uncertainties
- Rapid Response
  - 2022 NM wildfires



# Port-related emissions

- Objective - Assess how emissions from ports have impacted air quality and health, focusing on Atlanta (airport) and LA (ships, warehouses, airports)
- Methods - WRF-CMAQ-ISAM, TROPOMI NO<sub>2</sub>, Machine learning

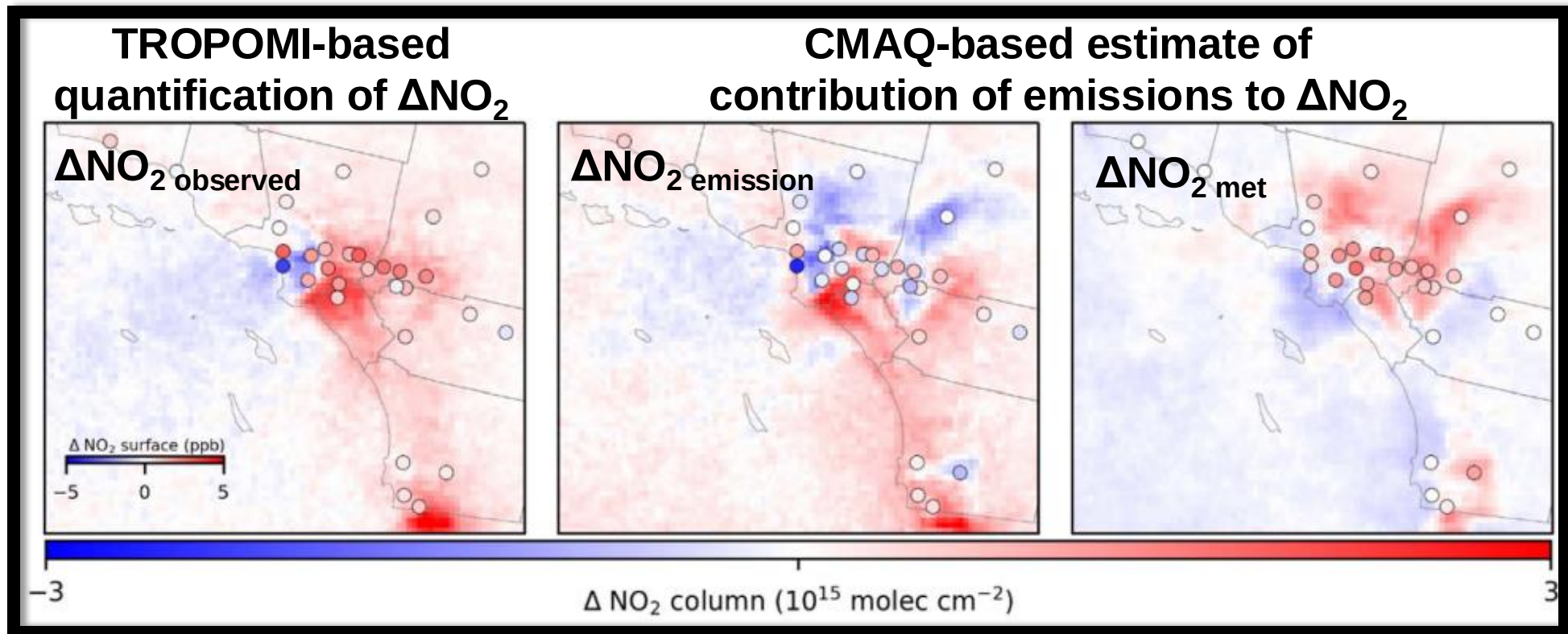


A. S. Lawal, A. G. Russell, and J. Kaiser: *Assessment of Airport-Related Emissions and Their Impact on Air Quality in Atlanta, GA, Using CMAQ and TROPOMI*. ES&T, 2022.



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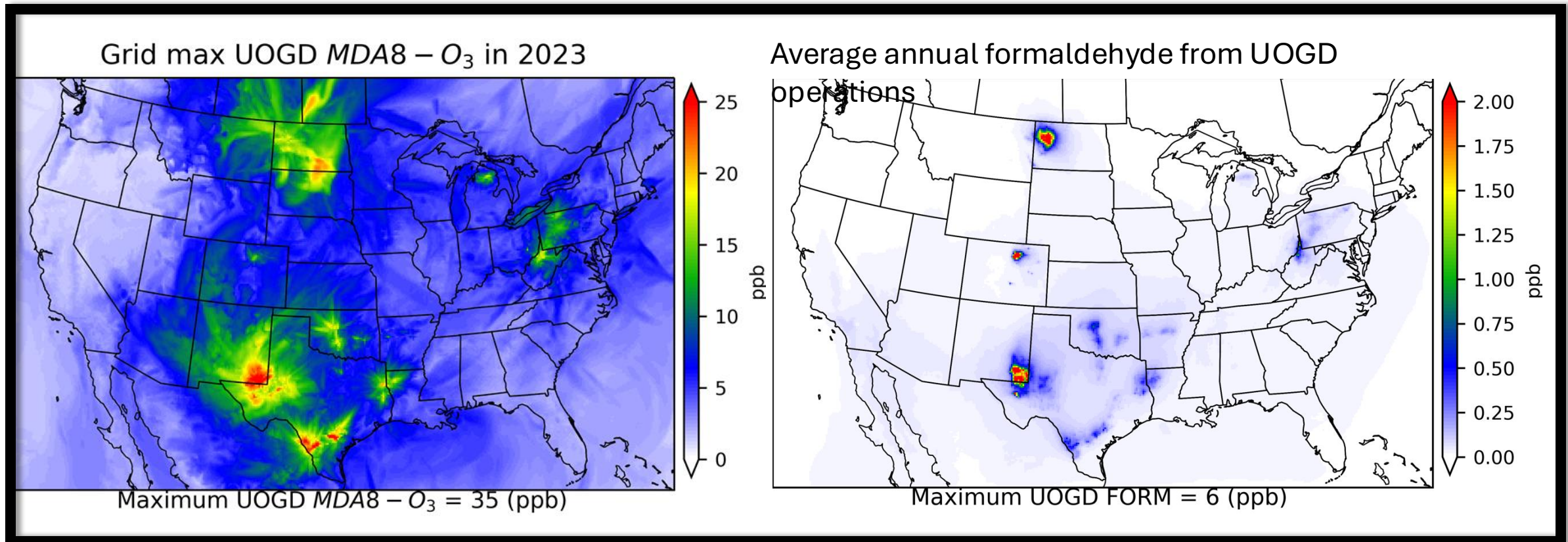
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T. N. Skipper, J. Kaiser, M. T. Odman, S. Hasheminassab, and A. G. Russell: **Local scale air quality impacts in the Los Angeles Basin from increased port activity during 2021 supply chain disruptions.** *Environ. Sci: Atmos*, 2024.

# Oil and Gas Operation Tiger Team

- Objective - Assess how emissions from O&G have impacted air quality over the same period as intensive HEI-funded field studies; identify biases in emissions inventories
- Methods - WRF-CMAQ-ISAM, TEMPO and TROPOMI NO<sub>2</sub>

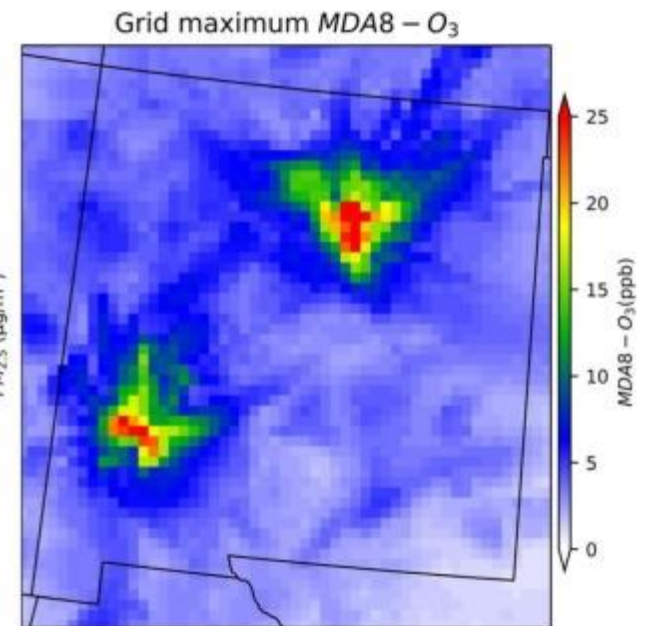
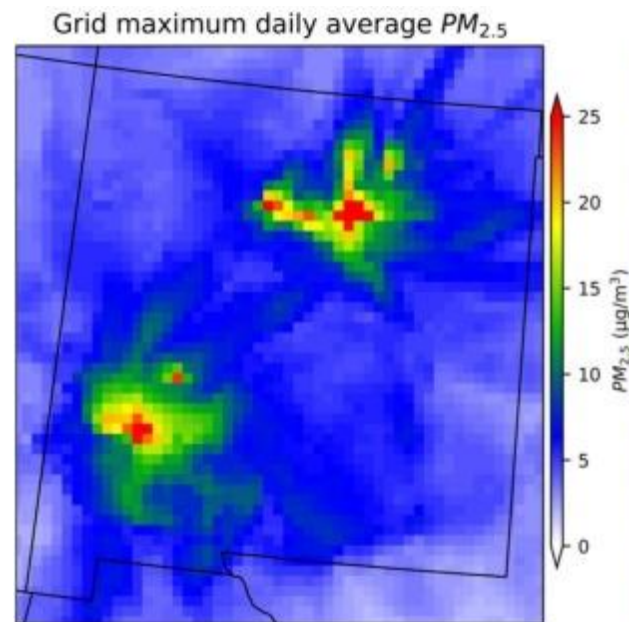
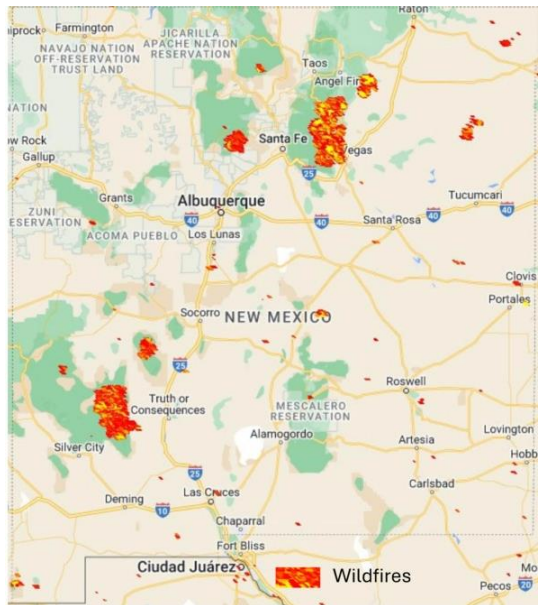




# Rapid Response Team: 2022 NM Fires

- Objectives- Estimate exposures and health impacts of 2022 New Mexico Fires
- Methods- CMAQ, satellite-based fire detection

## 22 premature deaths attributed to short-term AQ exposures



*K. J. Maji, et al.: Impact of the 2022 New Mexico, US wildfires on air quality and health. STOTEN, 2024.*

# Best outcome: students and post-docs

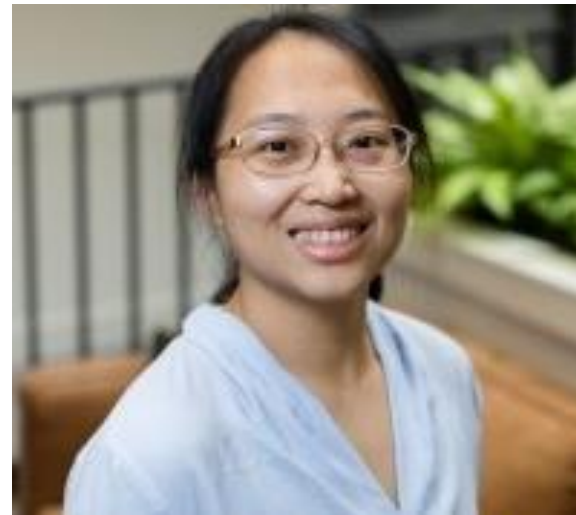
- Objectives- Develop the next generation of air quality and health researchers that can combine earth observations and models to address issues confronting the US
- Methods- Involve students, funded by HAQAST or not, in studies; Teach classes focusing on and integrating earth systems observations and models



**Dr. Abi Lawal** is now an assistant professor in CEE at the University of Connecticut



**Aryiana Moore** won an AWMA Environmental Management or Policy Research Scholarship



**Dr. Ziqi Gao** went to GA EPD- used TROPOMI and TEMPO to examine exceedances



**Dr. Asher Mouat** is now at GA EPD- an expert in ground-based remote sensing, here today!