2025 Award Winners

Jane Warren Awardees and Undergraduate Summer Fellowship

Health Effects Institute

HEI Summer Fellowship

A 10-week summer fellowship program with a stipend of $8,000 that pairs highly qualified undergraduate students (rising juniors and seniors) with volunteer mentors in the United States.

Opportunity to gain hands-on environmental health research experience to build skills and explore potential career pathways.

Students prepare a research proposal, present their work, and engage in professional development seminars.

In partnership with ISEE and ISES and funded by the American Chemistry Council, the Clinton Family Foundation, and individual donors.

HEI
Health Effects Institute

Summer Fellowship – Applications

	2023 Inaugural Year	2024	2025
Applications	52	81	**168**
Rising Juniors	29	36	**80**
Rising Seniors	23	45	**88**
Number of Institutions	30	48	**96**
Number of States	16	14	**30**
Volunteer Mentors	17	20	**26**
Cohort Size	7 fellows	8 fellows	**9 fellows**

5% acceptance rate

Applications are reviewed based on motivation, skills, experience, and need for the opportunity.

Fellows come from a variety of majors primarily in the sciences, such as public health, environmental science, biology, chemistry, geography, and health informatics.

Steady growth of the program over time.

HEI
Health Effects Institute

Summer Fellowship 2025

Olivia Alpizar
Rising Senior at University of Massachussetts, Amherst

Mentor: Elena Colicino, *Icahn School of Medicine*

Kayla Portillo
Rising Junior at Boston University

Mentor: Jonathan Levy, *Boston University School of Public Health*

Thet Mon Kyaw
Rising Senior at University of Southern California

Mentor: Regan Patterson, *University of California Los Angeles*

Elliot Lazarova-Weng
Rising Senior at University of California, Santa Cruz

Mentor: Robin Dodson, *Silent Spring Institute*

Peyton Morgan
Rising Senior at University of North Carolina, Chapel Hill

Mentor: Jennifer Richmond-Bryant, *North Carolina State University*

Valeria Martinez-Gutierrez
Rising Senior at Syracuse University

Mentor: Nicolas Lopez-Galvez, *San Diego State University*

Autumn Taliaferrow
Rising Senior at Vassar College

Mentor: Gary Adamkiewicz, *Harvard T.H. Chan School of Public Health*

Ahmed Shah
Rising Senior at University of Rochester

Mentor: Kelvin Fong, *George Washington University*

Sulaiman Mathew-Wilson
Rising Junior at Howard University

Mentor: Colleen Rosales, *OpenAQ*

HEI
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HEI Jane Warren Award

The Jane Warren Award supports early career graduate students and postdocs in attending and presenting at the HEI Annual Conference.

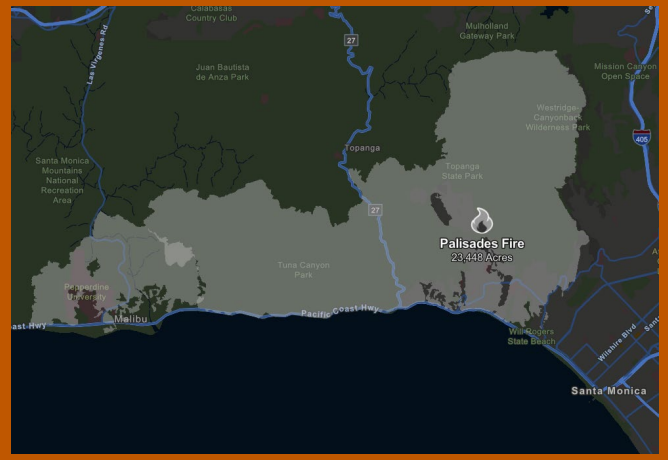
Up to 3 local researchers and 3 researchers based anywhere in the United States are selected each year for the award. The award covers registration costs for all awardees plus travel and accommodations for non-local winners. Winners present their work in a lightning talk and poster session during the conference.

The award is named in remembrance of Dr. Jane Warren who led HEI's scientific activities as the Director of Science from 1999 until her retirement in 2008.

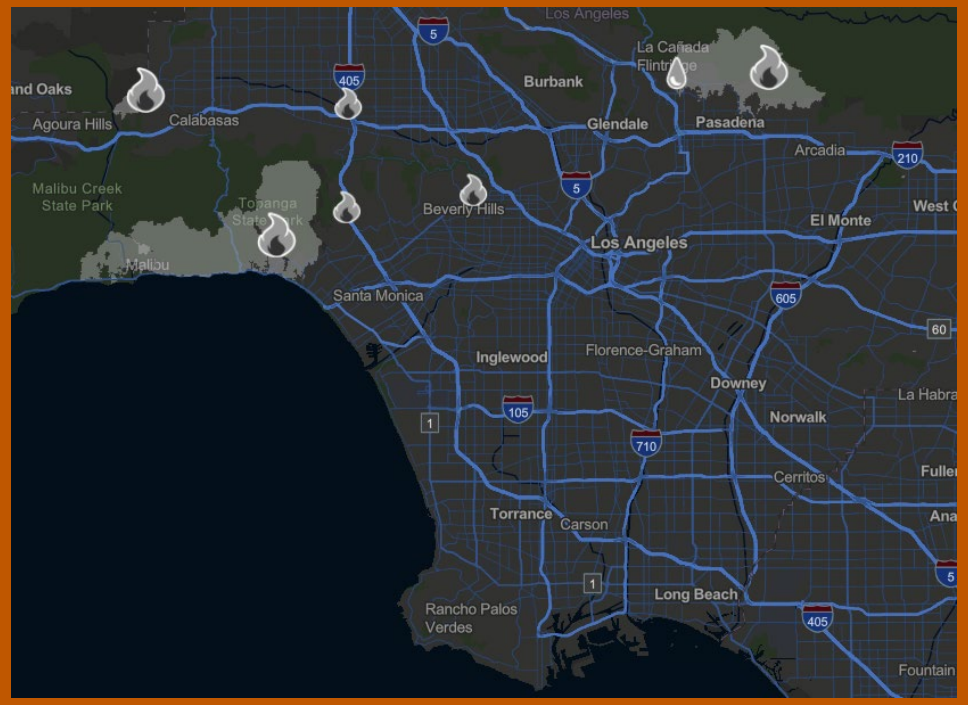
HEI
Health Effects Institute

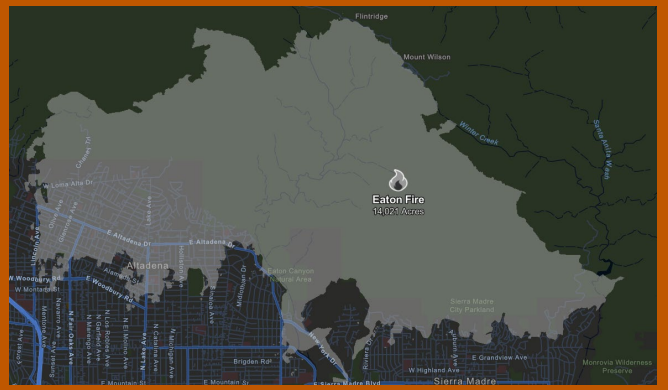
POLLUTANT EXPOSURE FOLLOWING FIRES AT THE WILDLAND URBAN INTERFACE

Early Insights from the Eaton and Palisades Fires



Maps: CAL FIRE





ALBERT KYI, D. Sung, K. Konon, C.Y. Chao, M. Meyer, E.J. Thompson, S. Zhai, L. El Khoury, E. Deveraux, C. Schissel, Y. Kimura, C.H. Lin, A. Neville, S. Stokes, P. Misztal, D.T. Allen, L. Hildebrandt Ruiz

Graduate Research Assistant, The University of Texas at Austin

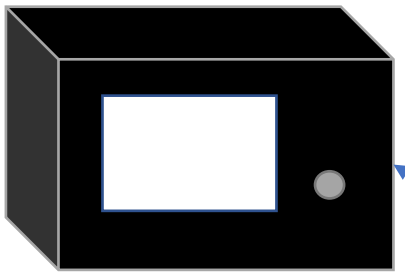
May 4th, 2025

The University of Texas at Austin ™
McKetta Department of Chemical Engineering
Cockrell School of Engineering

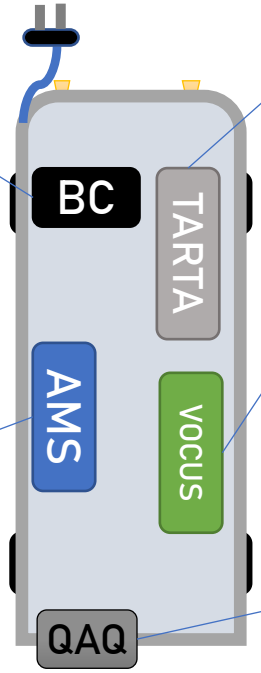
LA FIRE HEALTH STUDY

Measurement Equipment

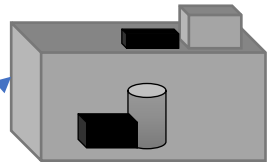
AE33 Aethalometer
(Black Carbon)



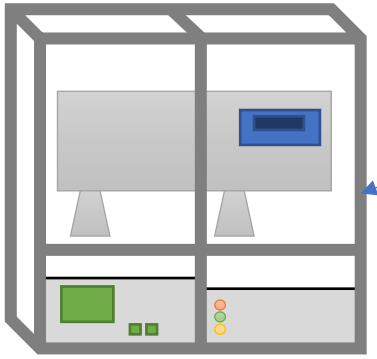
Electric Van
(Ford E-Transit)



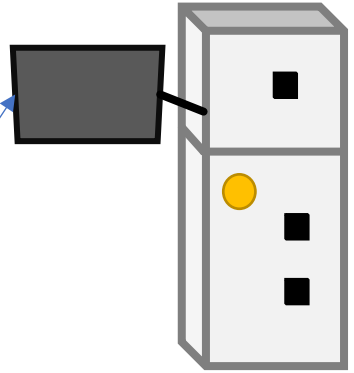
Toxic-Metal Aerosol
Real-Time Analysis
(Heavy Metals)



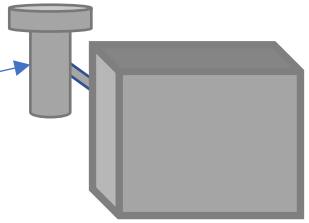
Aerosol Mass Spectrometer
(non-refractory PM1)



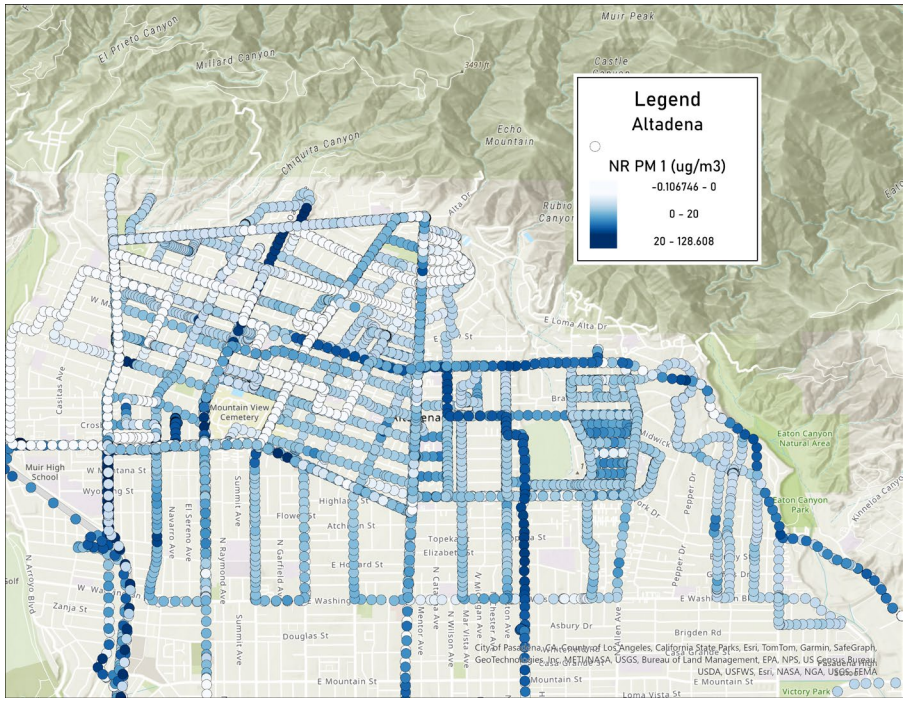
VOCUS
PTR-ToF-MS
(VOCs)



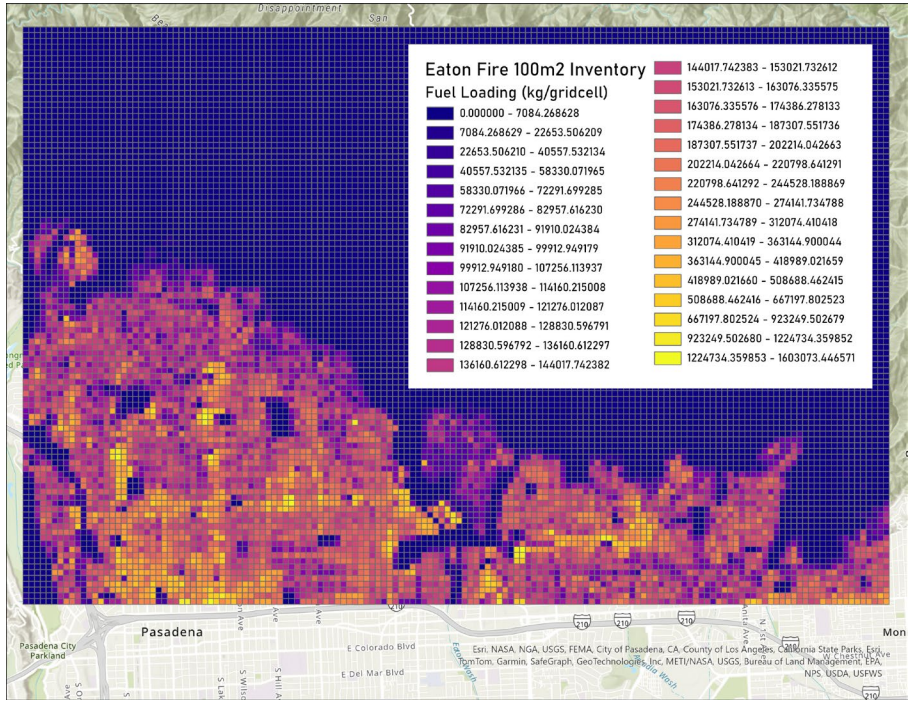
QuantAQ
Modulair PM
(RH, PM, etc…)



Neighborhood Measurements + Fuel Inventory



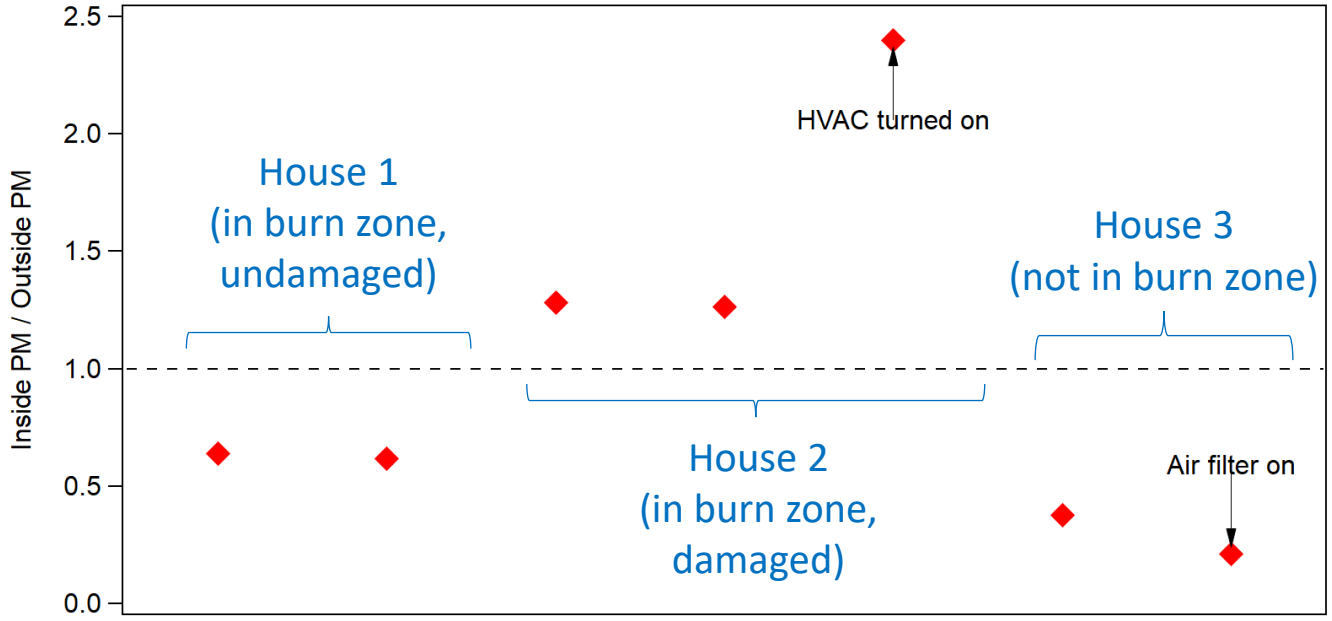
- > 1,300 miles of multi-hour drives
- Varying routes, weather, and times of day
- PM1 higher in Altadena (7 ug/m^3) than Palisades (4 ug/m^3), dominated by organic PM (85%)
- Upcoming Positive Matrix Factorization analysis



- 100 m x 100 m gridded inventory of fuel loadings
- Urban fuel calculation based on parcel data, Tax Assessor data, and fuel loading factors
- Can be compared against pollutant emissions

Household Measurement: Sources & Sinks

- 11 volunteer homes with varying locations + damage
- Indoor/Outdoor Sample Switching
- Behavior of indoor/outdoor varied greatly between houses
- Filters potentially effective (PM1)
- Some elevated level of pollutants remained in HVAC systems



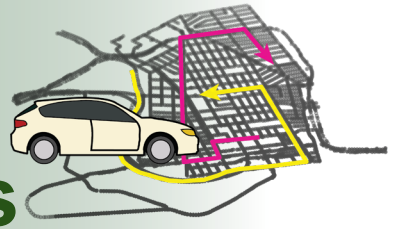
High-Resolution Urban Emission Mapping

Bridging Gaps Between Inventories and Hyperlocal Observations

Chirag Manchanda,[a] Ronald C. Cohen,[a] Ramon A. Alvarez,[b] Tammy M. Thompson,[b] Maria H. Harris,[b] Julian D. Marshall,[c] Alexander J. Turner,[c] Robert A. Harley,[a] Joshua S. Apte [a]

[a] University of California, Berkeley, USA
[b] Environmental Defense Fund, USA
[c] University of Washington, Seattle, USA

Hyperlocal Observations



Emission Inventories

BC Concentration (μg/m^3)

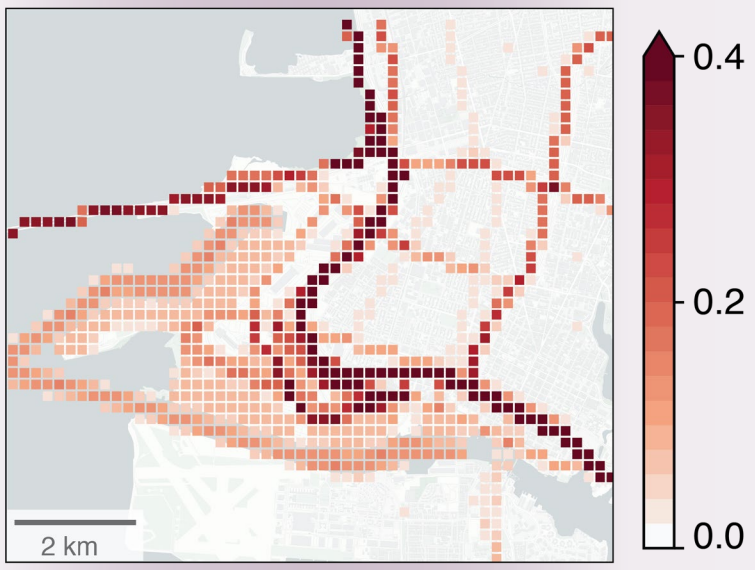
Fine-scale concentrations

What impacts whom and by how much?

Bayesian Inverse Modeling

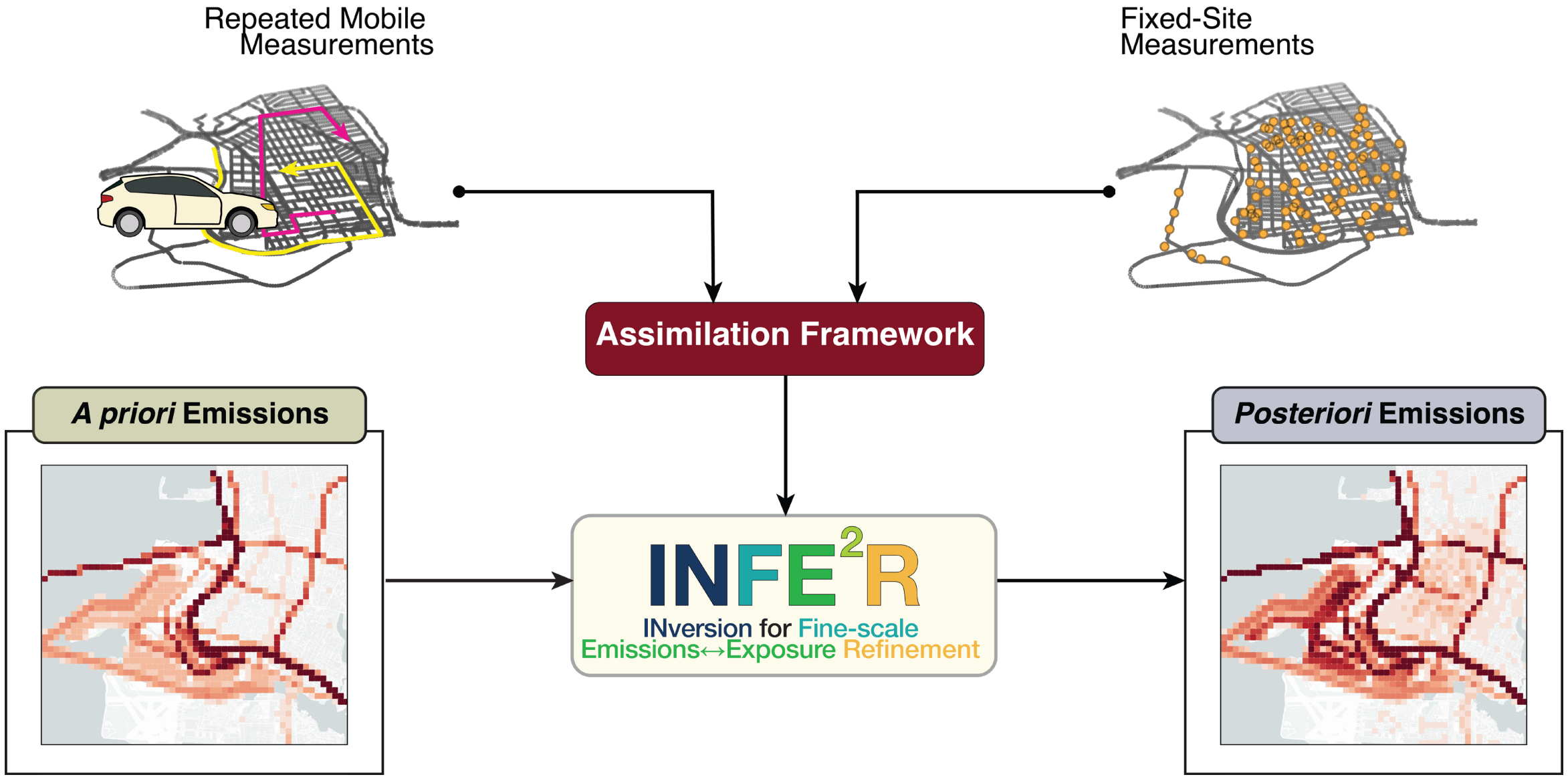
Requires spatiotemporally dense observations

BC Emission Flux (kg h^{-1} km^{-2})

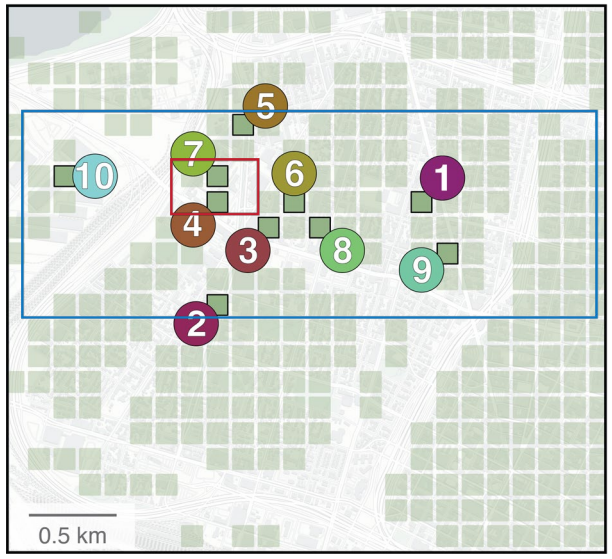


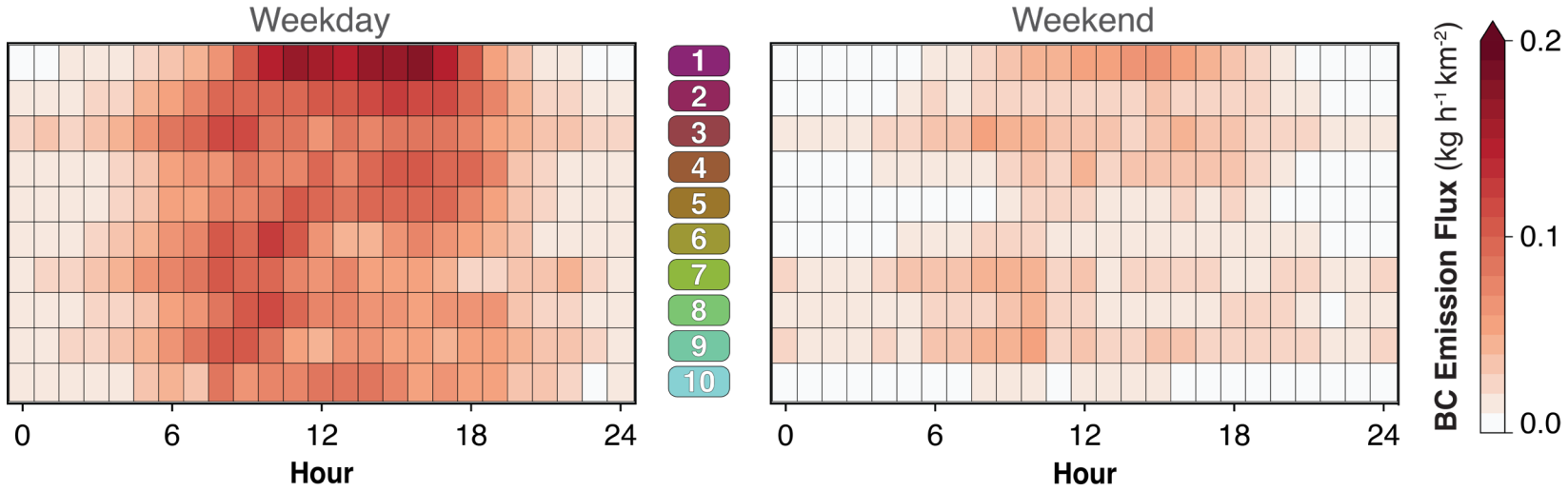
Inherently source resolved

Missing sources
Misattributed contributions
Suboptimal mitigation


Repeated Mobile Measurements
Fixed-Site Measurements
Assimilation Framework
A priori Emissions
Posteriori Emissions
INFE2R
INversion for Fine-scale Emissions↔Exposure Refinement

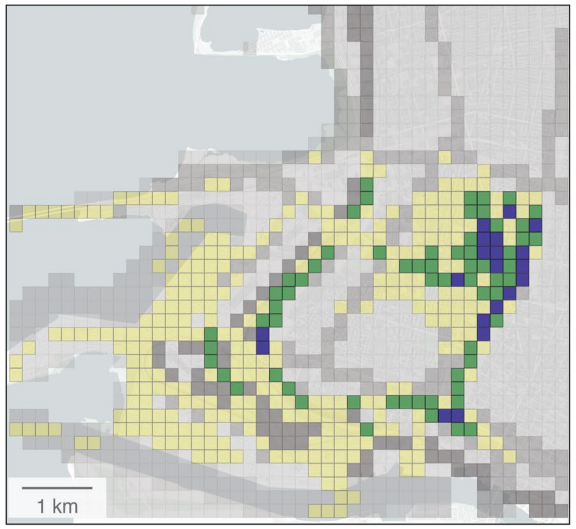
Neighborhood-scale point sources missing in emissions inventory

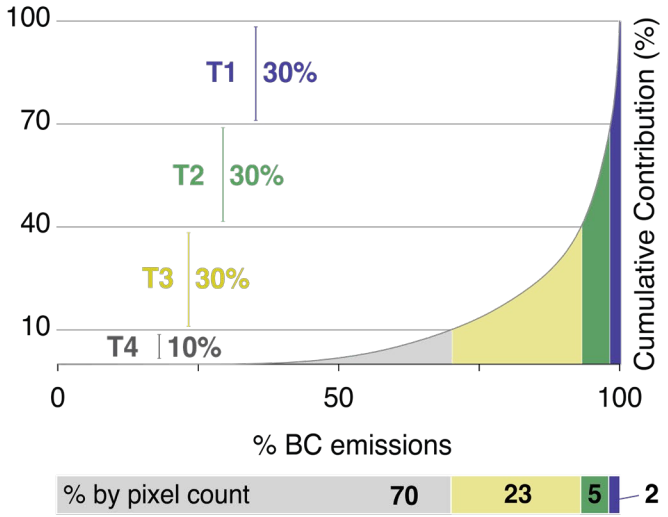




Hoover-Foster Neighborhood

Precise attribution of impacts back to emission sources





Disentangling Impacts:

Proximate – Low Emissions
Distant – High Emissions

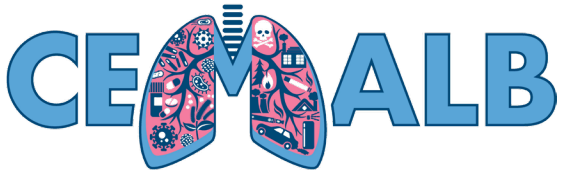
TAKEAWAYS

- Observationally constrained hyperlocal emission inventories.
- Measurement informed source attribution and mitigation impact assessment.
- Scalable and robust to observational and inventory errors.

Webpage

chiragm@berkeley.edu

Check out our poster!!



Inhaled Vitamin D as a Protectant Against Air Pollution

Kevin Schichlein

Air Pollution is a Public Health Threat

Nearly 4 in 10 people in America live in places with unhealthy levels of air pollution

People of color are 2.3 times as likely as white people to live in a county with failing air quality grades

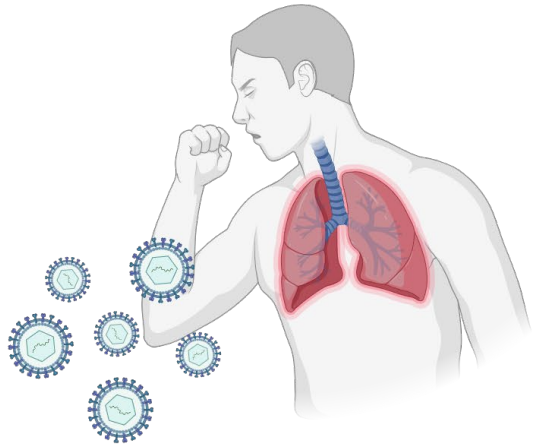
Climate change has led to increases in high pollution days and the number of wildfires

Strategies to mitigate the negative health effects of air pollution are needed

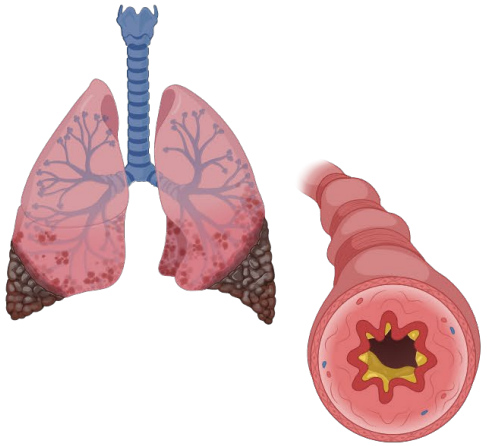
Source: American Lung Association

Vitamin D Deficiency and Lung Health

Air pollution associated with decreased levels of vitamin D



Vitamin D levels have been linked to severity and occurrence of respiratory infection

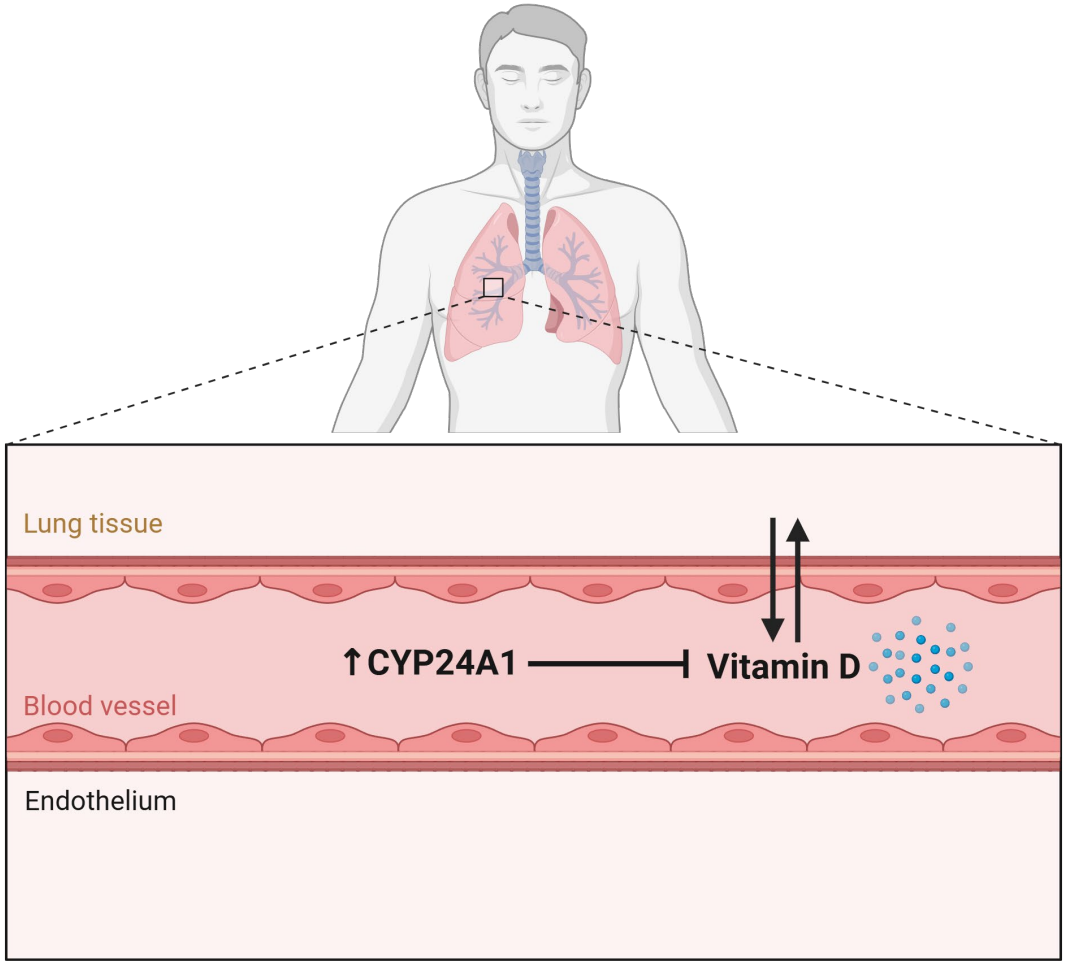


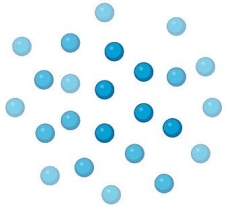
Vitamin D deficiency is characteristic of asthma, COPD, CF, and IPF

Why have studies of vitamin D supplementation to protect against lung pathologies failed?

Oral Supplementation Does Not Reach the Airway Epithelium

- The inactivating enzyme of vitamin D, CYP24A1, is highly expressed in the pulmonary endothelium
- Limits vitamin D entry into the airway epithelium
- **Inhaled vitamin D may allow for direct delivery to the airway epithelium**

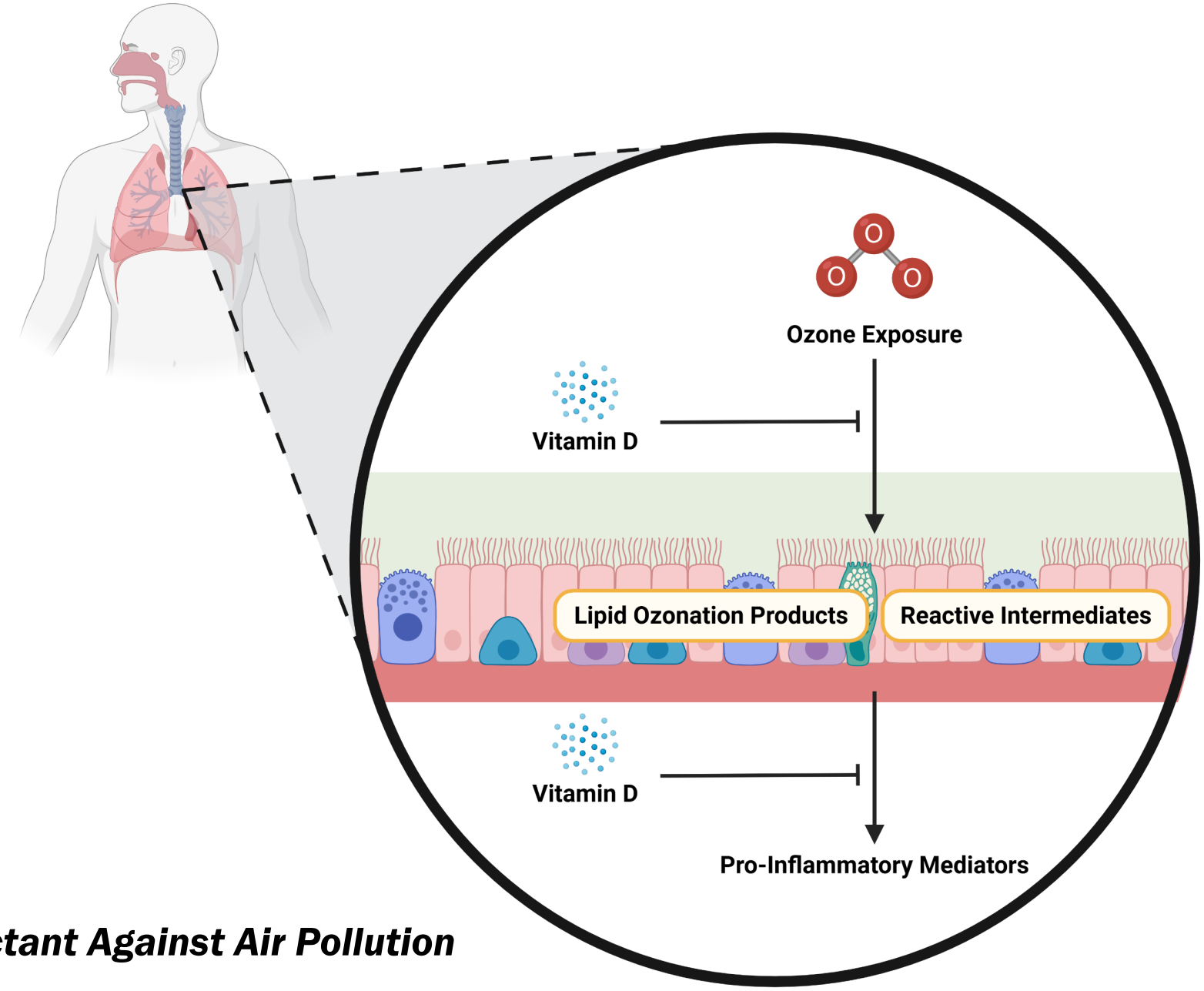




Vitamin D Aerosol

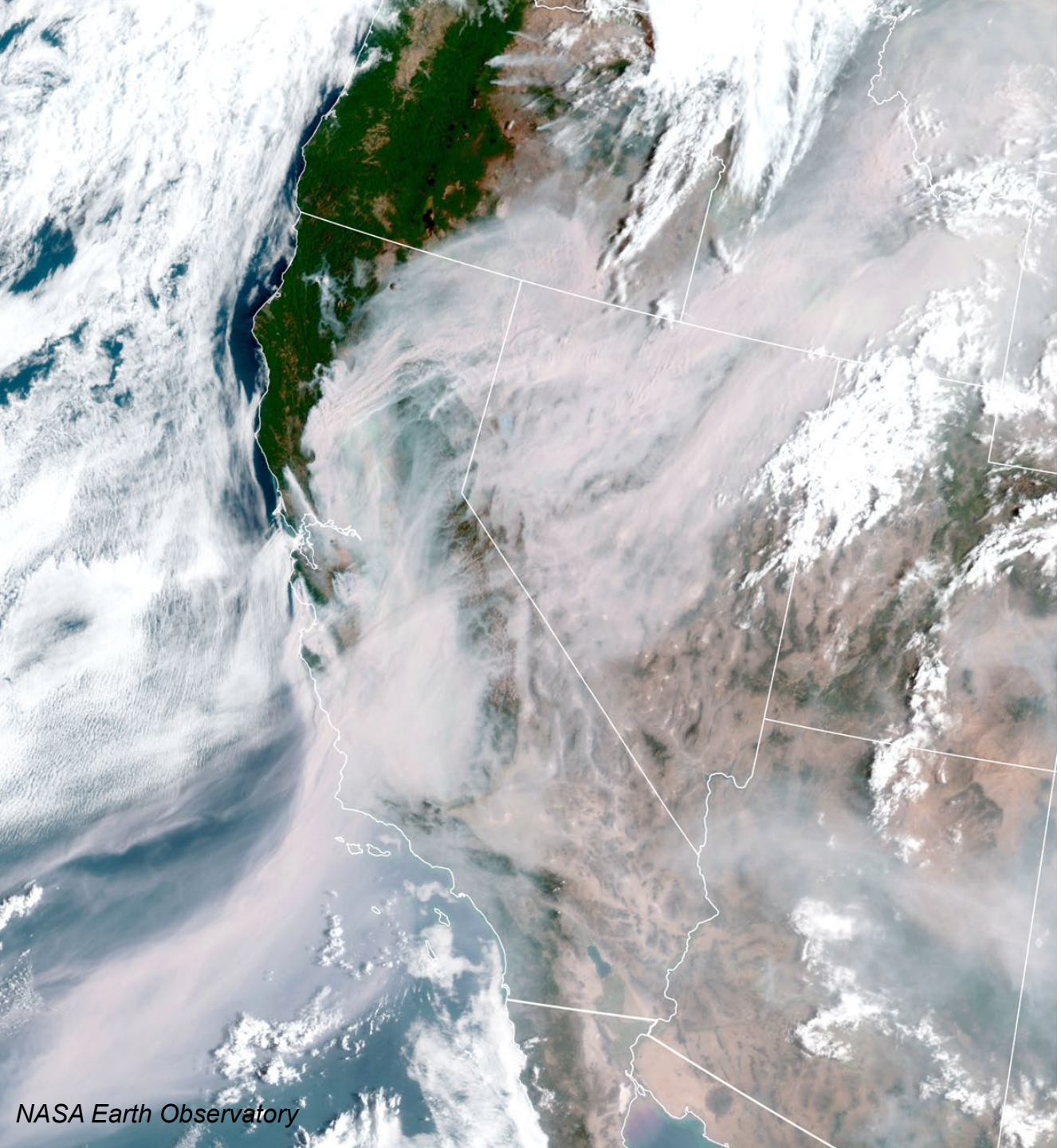
Air Pollution

Can inhaled vitamin D supplementation attenuate pathological responses to ozone?



Poster 26

Inhaled Vitamin D as a Protectant Against Air Pollution



Compounding Effects of Wildfire-Specific $PM_{2.5}$ and Baseline Vulnerabilities on Pediatric Asthma in Northern California

Rebecca Sugrue, PhD; Stephanie Holm, MD, PhD, MPH; Andrew Nguyen, MPH; Morgan Ye, MPH; Rosana Aguilera Becker, PhD; Dayna Long, MD; Tarik Benmarhnia, PhD; Rosemarie De La Rosa, PhD, MPH; Neeta Thakur, MD, MPH

UCSF University of Californ San Francisco

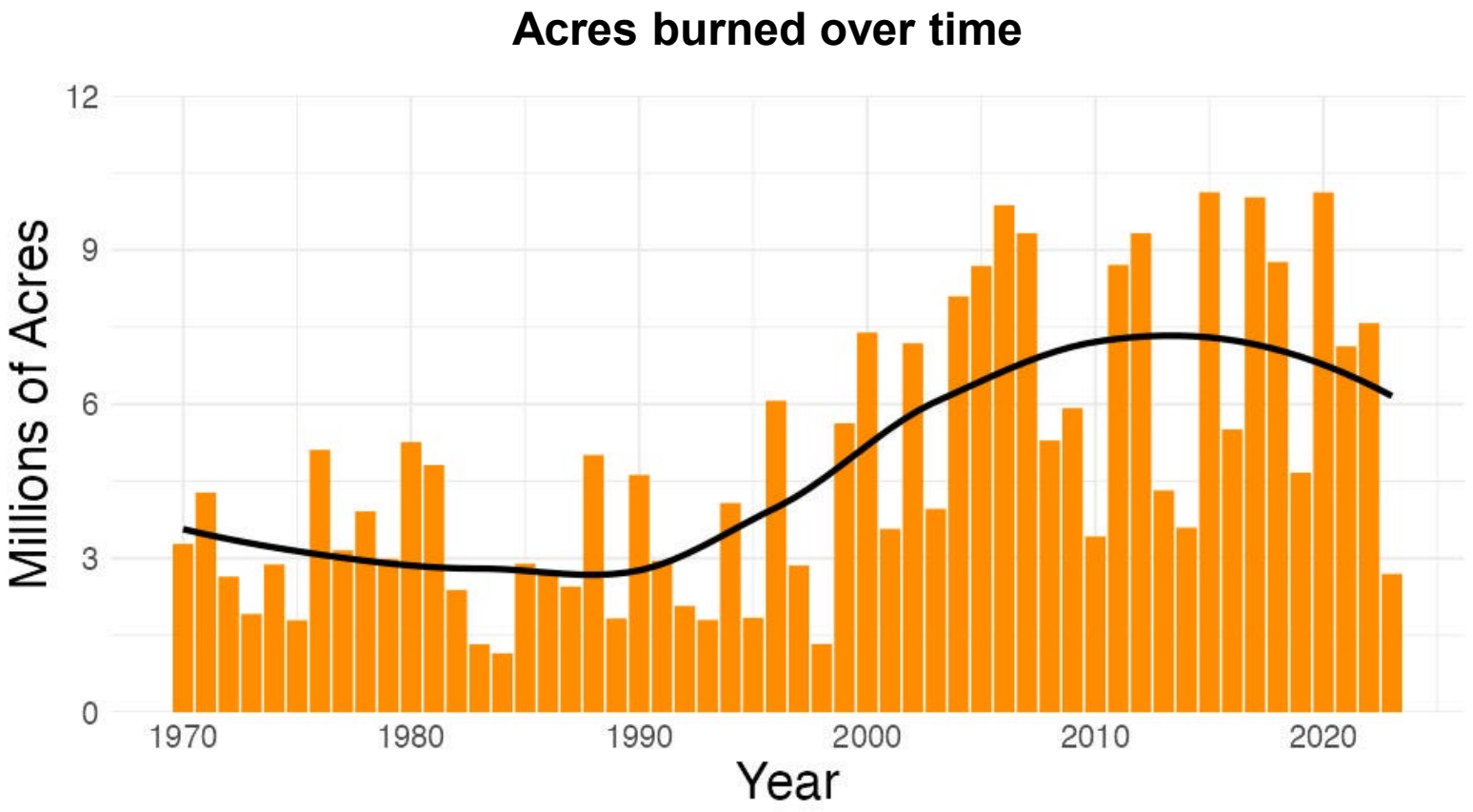
CLEAR Lab Collaborative Learning for Equity and Respiratory Health

UCSF Benioff Children's Hospitals

Berkeley Public Health

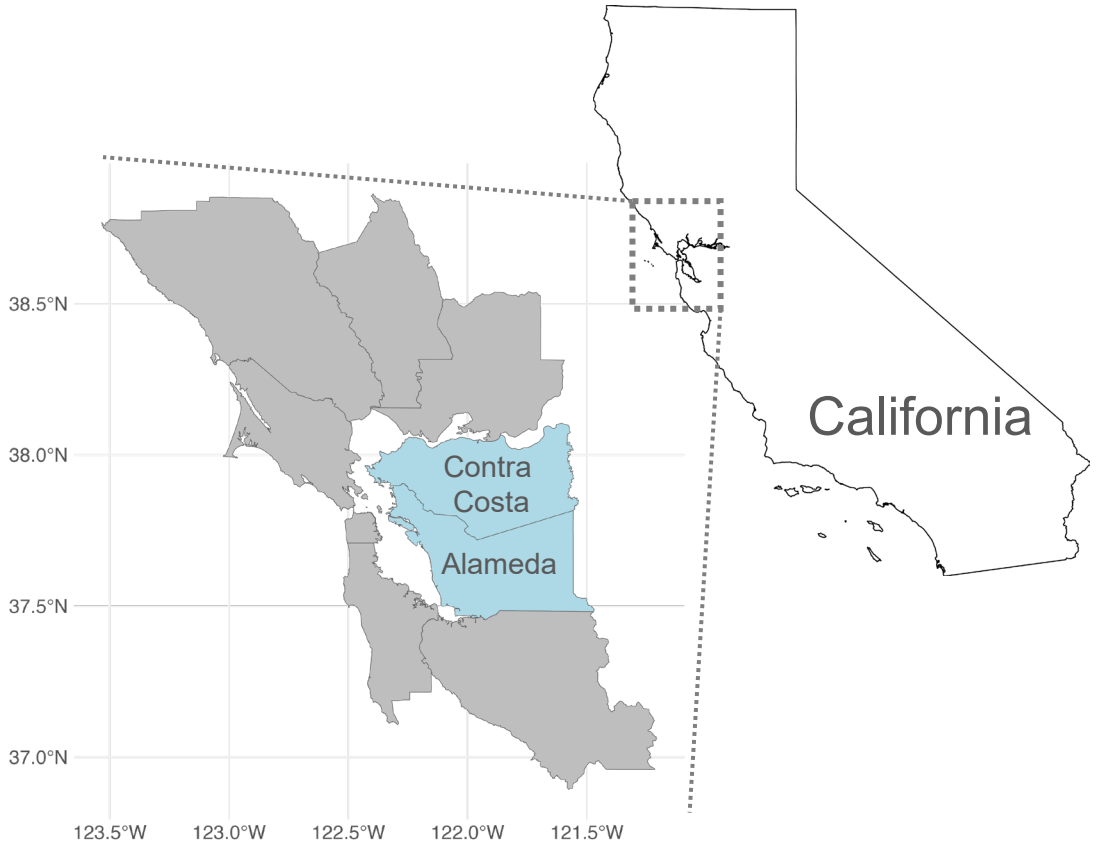
UC San Diego

Wildfire smoke events and their impact have increased

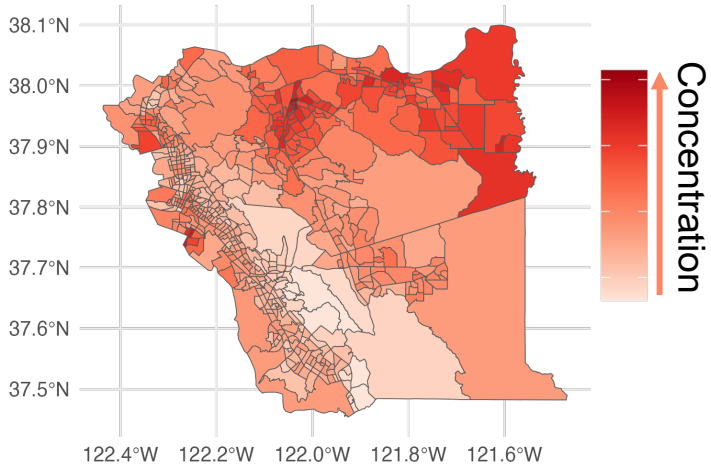


Increasing wildfire smoke events have resulted in further evidence linking smoke with exacerbations of respiratory disease

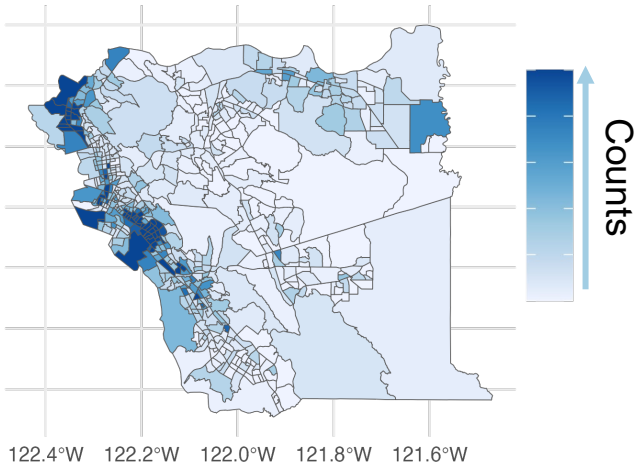
Goal: Determine the association between wildfire-specific $PM_{2.5}$ and asthma-related hospital visits among children in Alameda and Contra Costa Counties.



Average WF $PM_{2.5}$



Total asthma-related hospital visits



Developed distributed lag model to account for day-to-day influences

Analysis: The associations between wildfire-specific $PM_{2.5}$ concentrations and daily counts of asthma-related hospital visits were estimated using a 6-day distributed lag model with random effect for census tract

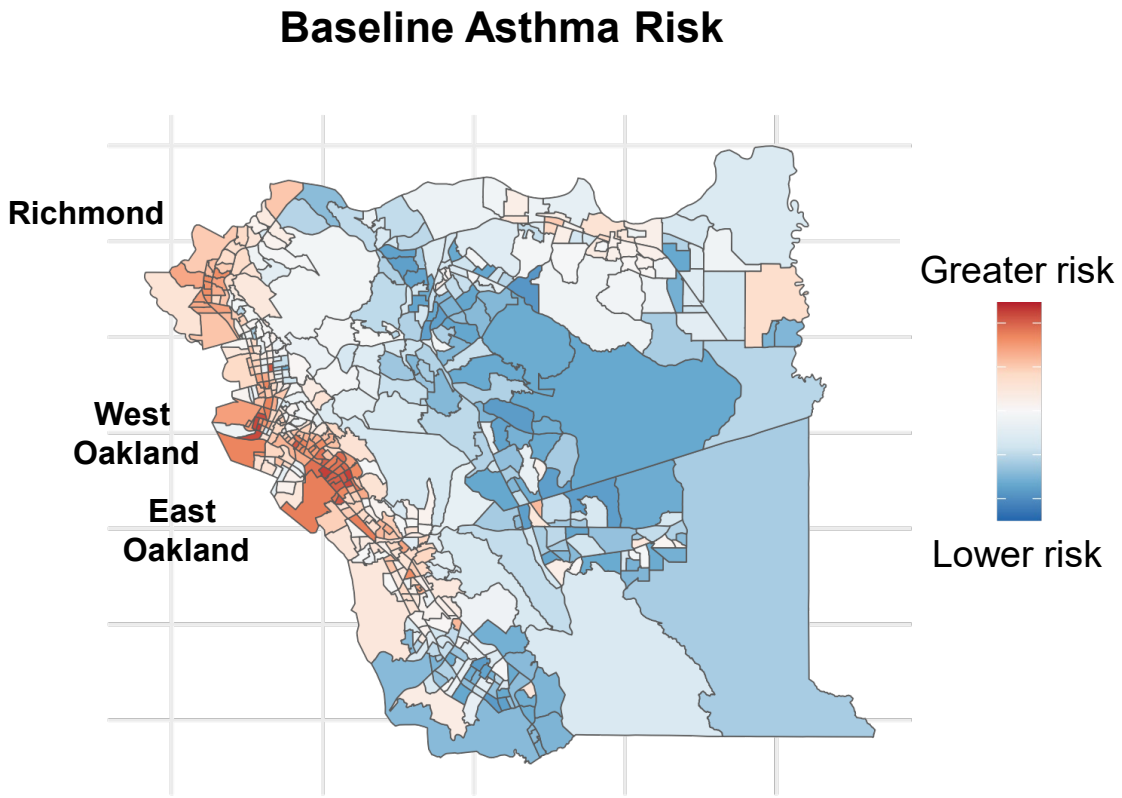
Asthma-related hospitalizations ~ Wildfire $PM_{2.5}$ + Temperature + Season + Population + Random effect for census tract

$$\log(\lambda_{it}) = \beta_0 + \beta_{WF} \cdot \mathrm{CB}_{WF,it} + \beta_{Temp} \cdot \mathrm{CB}_{Temp,it} + \beta_{Time} \cdot \mathrm{Time}_t + \mathrm{Offset} + u_i$$

i = census tract
t = *day*
WF = wildfire $PM_{2.5}$
Temp = daily minimum temperature

Higher baseline risk in known vulnerable communities

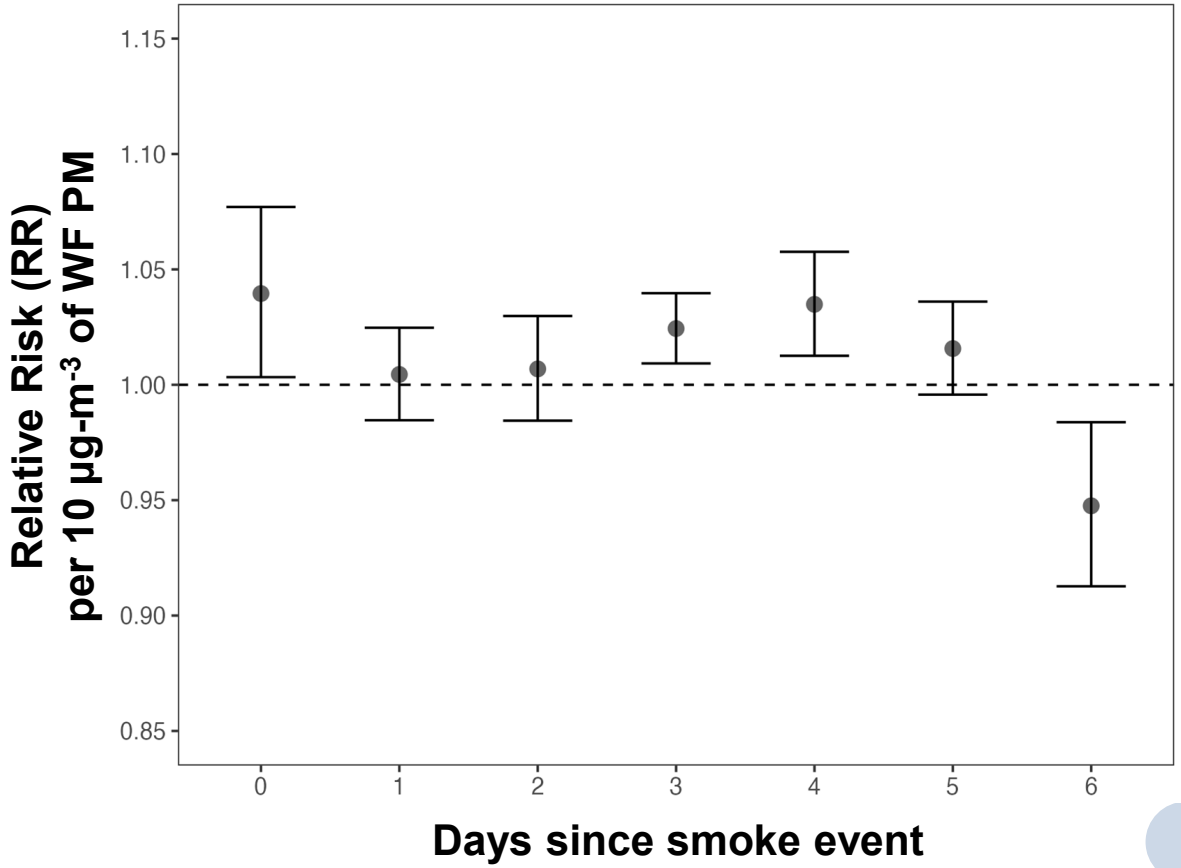
Spatial clusters with higher baseline risk to asthma-related hospitalizations are found in designated disadvantaged communities by CalEnviroScreen



Immediate and delayed increased risk due to wildfire smoke exposure

Wildfire smoke exposure was associated with increased risk of asthma-related hospital visits for **days 0, 3, and 4**

Days since smoke event	RR per 10 µg-m^{-3} WF $PM_{2.5}$
0	**1.04 (1.00, 1.08)**
1	1.00 (0.98, 1.02)
2	1.01 (0.98, 1.03)
3	**1.02 (1.01, 1.04)**
4	**1.04 (1.01, 1.06)**
5	1.02 (0.99, 1.04)
6	0.95 (0.91, 0.98)

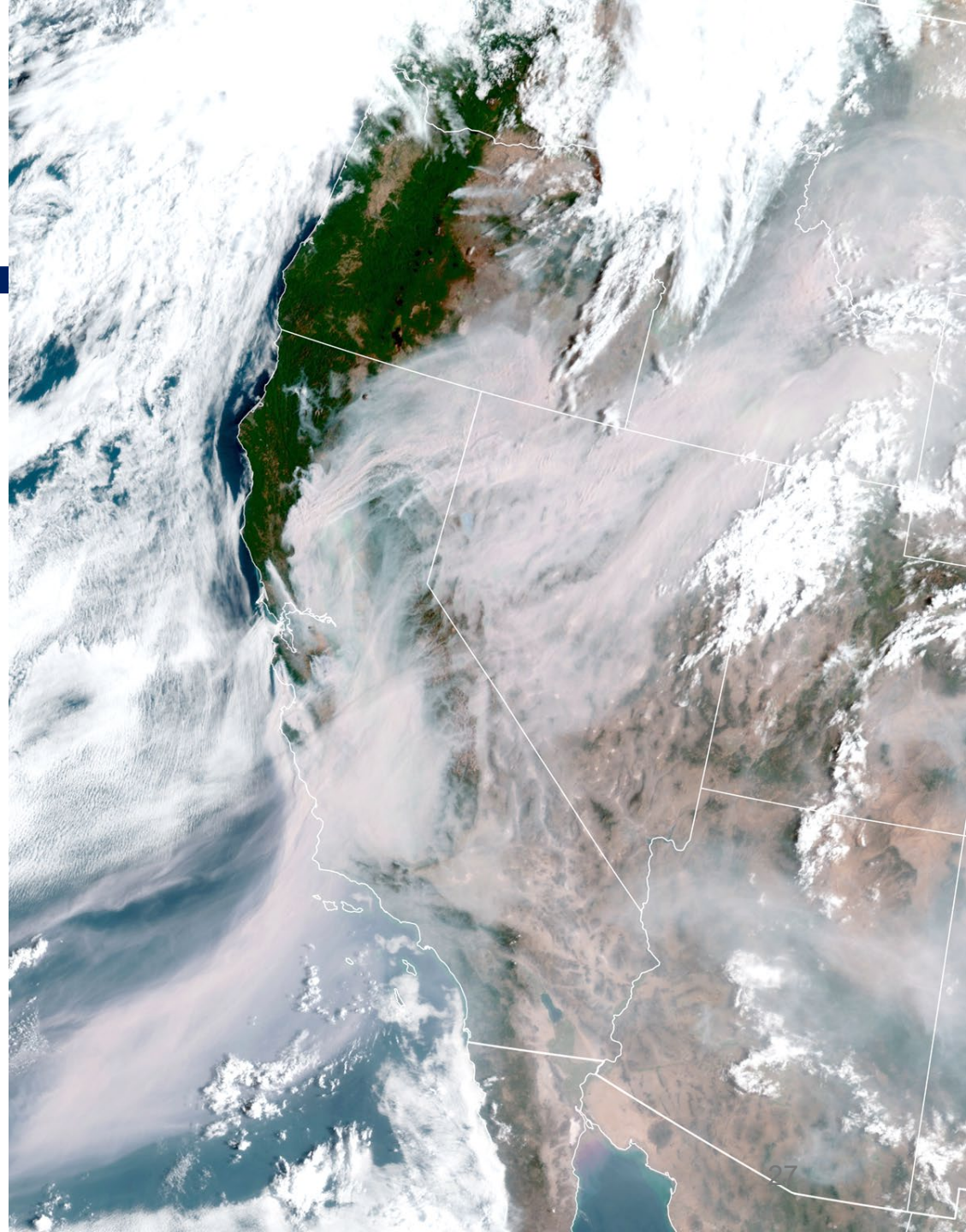


Takeaways

- Both the day of exposure and following days of wildfire smoke exposure have been found to be associated with asthma-related hospital visits of a pediatric population in Northern California

Next Steps

- Expanding the geographic scope and incorporating multiple healthcare settings
- Integrate qualitative methods to provide insights into the behavioral adaptations and community-level responses during wildfire events



The University of Texas at Austin
McKetta Department
of Chemical Engineering
Cockrell School of Engineering

Sources of Ozone, Particulate Matter, and Their Precursors in the El Paso Area

Shihao Zhai[1], Daniel Sung[2], Kyle Druckman[2], Kacper Przykaza[2], Lea El Khoury[1], Pawel Misztal[2], Lea Hildebrandt Ruiz[1]

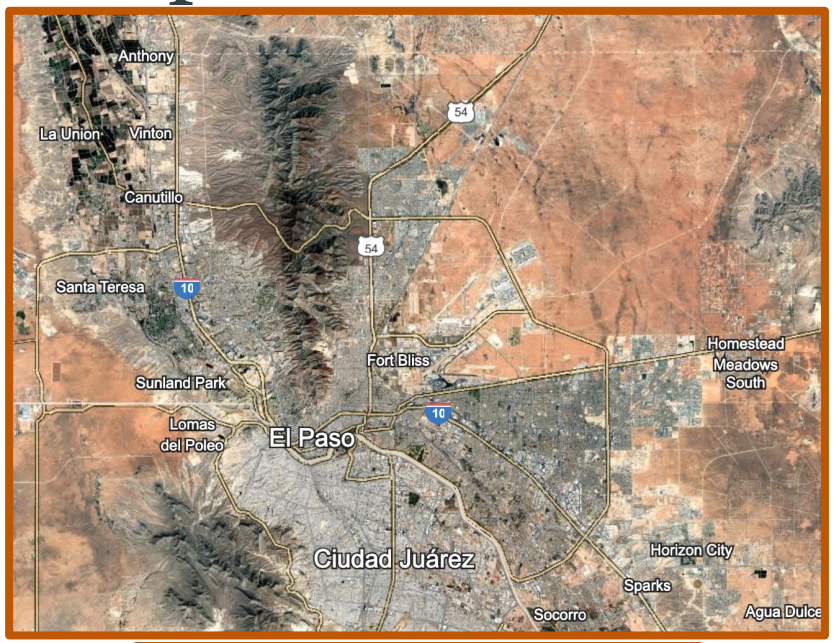
HEI
Jane Warren Award

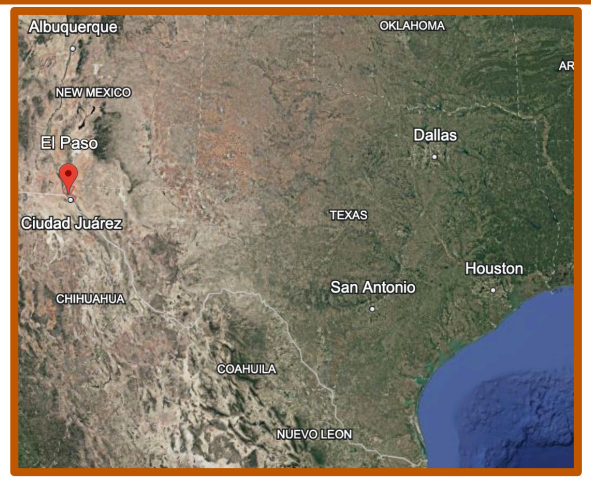
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
AQRP

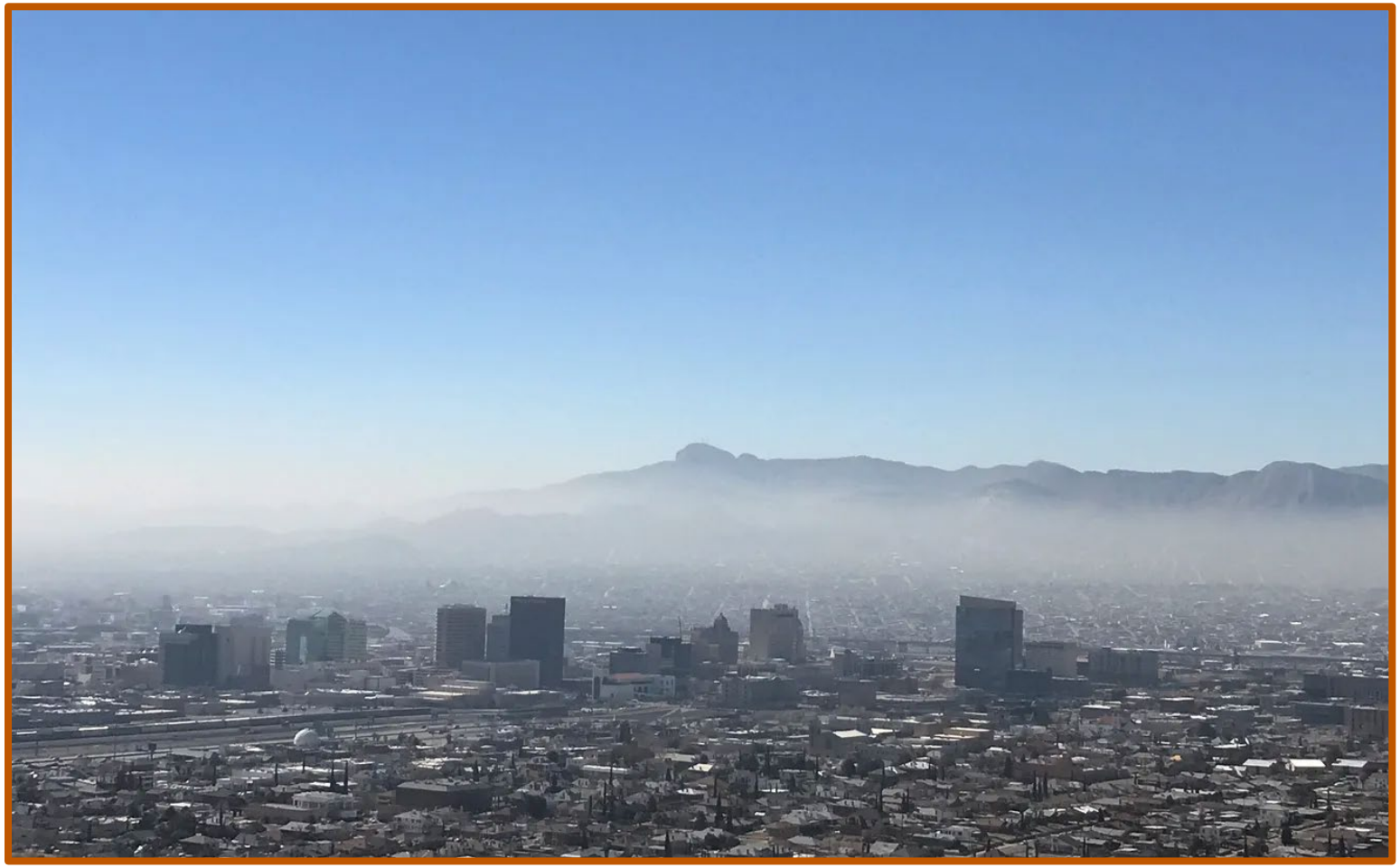
[1]McKetta Department of Chemical Engineering

[2]Maseeh Department of Civil, Architectural and Environmental Engineering

El Paso has exceeded the NAAQS for $PM_{2.5}$; Understanding composition and sources of $PM_{2.5}$ is crucial.



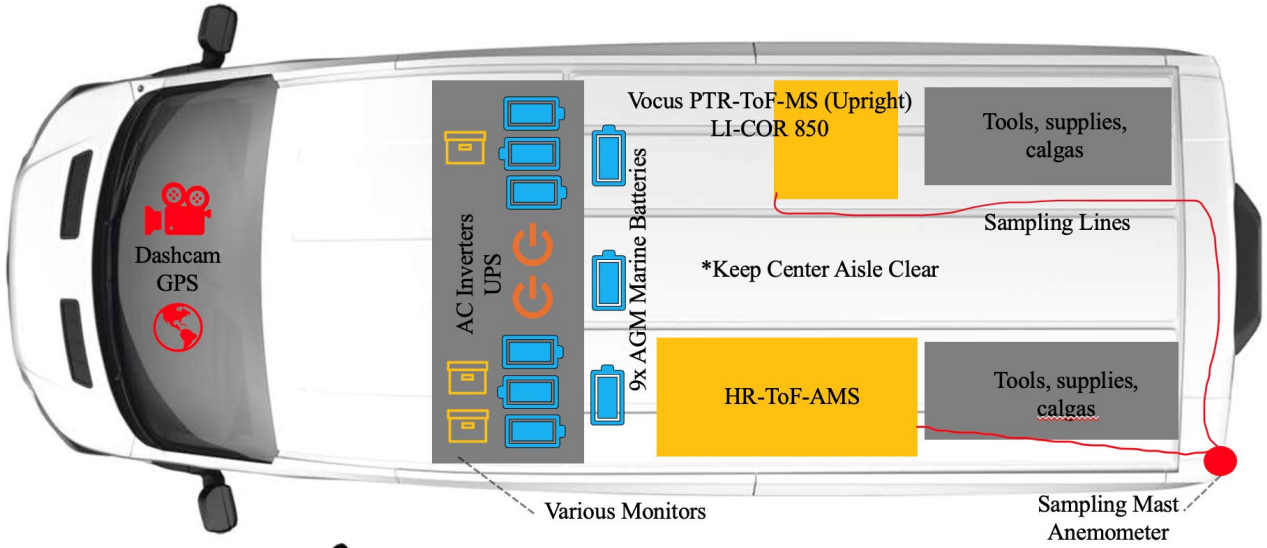




El Paso smog in summer 2022 (El Paso Times)

Instruments used:

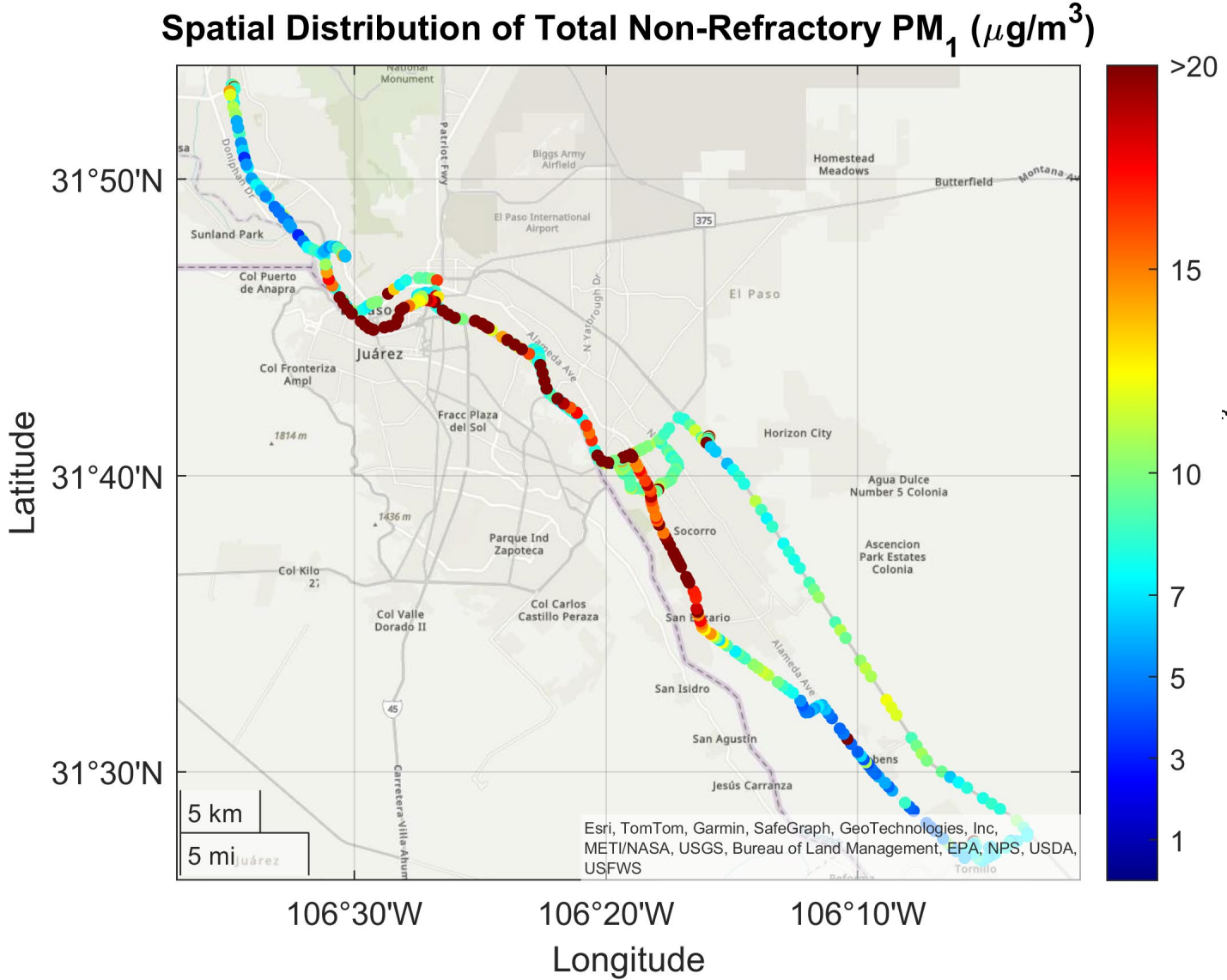
2022 Ford E-Transit

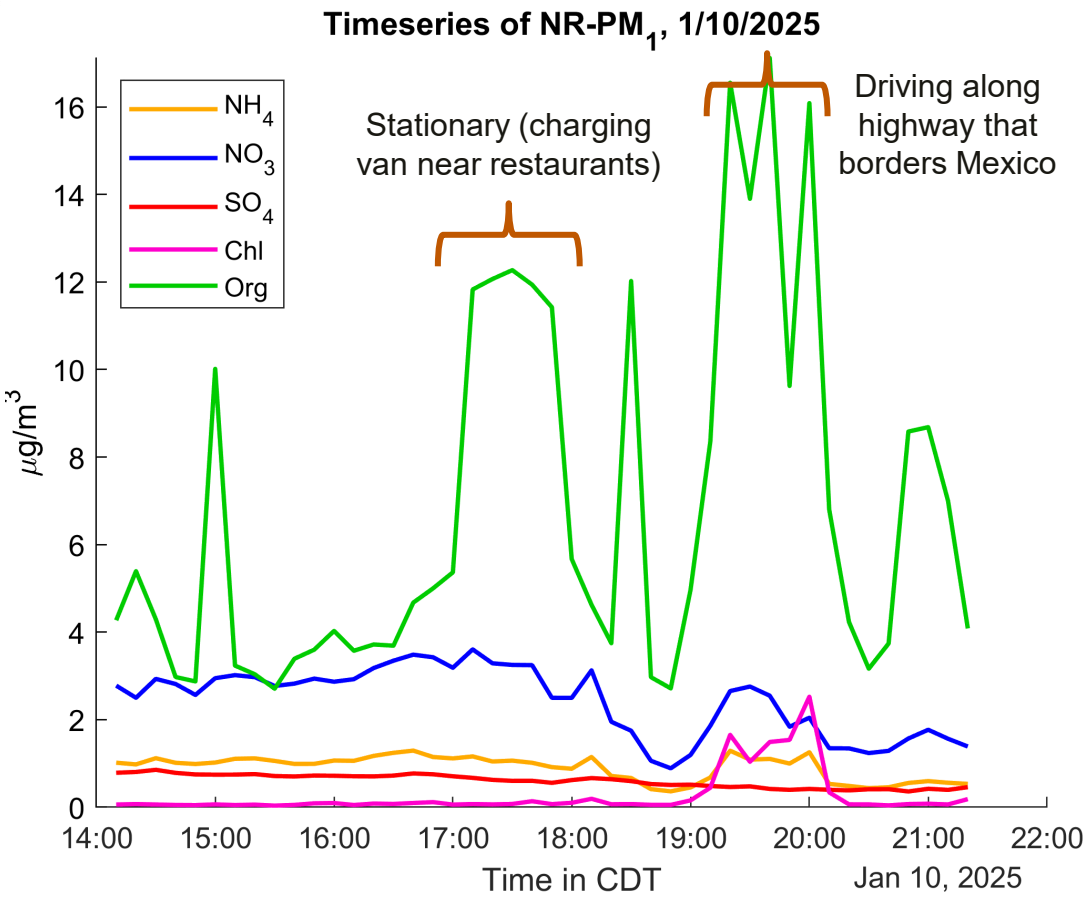


Vocus 2R PTR-ToF-MS

HR-ToF-AMS

Cross border transport and wind direction could contribute to PM_1 enhancements.





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