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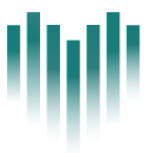
Center for Healthy Climate Solutions

# 1ST ANNUAL LA FIRES RESEARCH CONFERENCE

Understanding the Fires: Research in Action

JANUARY 14, 2026

University of California, Los Angeles



LA FIRE  
HEALTH  
STUDY

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# 2026 LA Fires Conference - January 14, 2026

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*The UCLA Center for Healthy Climate Solutions acknowledges our presence on the traditional, ancestral and unceded territory of the Gabrielino/Tongva peoples.*

# Agenda

- 8:00am **Registration & Breakfast**
- Registration located in *3<sup>rd</sup> Floor Rotunda*
  - Breakfast in *North Promenade and Grand Horizon Ballroom*
- 9:00am **Welcome & Opening Remarks** *Grand Horizon Ballroom*
- Introduction by David Eisenmann, UCLA
  - Julio Frenk, Chancellor, UCLA
- 9:15am **The LA Fires Were a Multi-Media Disaster: A synthesis of our air, water, soil, and debris contaminations**  
*Grand Horizon Ballroom*
- Moderated by Yifang Zhu, UCLA Fielding
  - Scott Fendorf, Stanford University
  - Sina Hasheminassab, CalTech / JPL
  - Chris Olivares, UC Irvine
  - Jiachen Zhang, University of Southern California
  - Krystal Pollitt, Yale
  - Josh West, University of Southern California
- 10:15am **Exposure Panel: How do we reconstruct and model wildfire exposures in a way that is useful for future studies such as health effects?** *Grand Horizon Ballroom*
- Moderated by Michael Jerrett, UCLA Fielding
  - David Allen, University of Texas, Austin
  - Joe Allen, Harvard T.H. Chan School of Public Health
  - Sudipto Banerjee, UCLA Fielding
  - Erika Garcia, University of Southern California
  - Mike Kleeman, UC Davis
  - Claire Schollaert, UCLA Fielding
- 11:00am **Research Poster Session & Coffee Break**
- Poster Session in *South Promenade, North Ridge, and West Coast* (see details on pages 5 – 33)
  - Coffee and Tea in *North Promenade*
- 11:45am **Capturing Disaster Data Before It Disappears: Insights from scientists, philanthropists, and public agencies**  
*Grand Horizon Ballroom*
- Moderated by David Eisenman, UCLA Fielding / David Geffen School of Medicine
  - David Abramson, NYU School of Global Public Health
  - Harry Allen, U.S. EPA
  - Brandon Levin, Snap Inc.
  - Nichole Quick, LA Dept of Public Health
  - Sanjay Mohanty, UCLA Samueli School of Engineering
  - Nicole Maccalla, Eaton Fire Residents United / University of Southern California
  - Patrick Wong, CA Air Resources Board
- 12:30pm **Lunch is Served** *North Promenade and Grand Horizon Ballroom*

- 12:45pm **Lunchtime Speakers: Lessons from the Maui Wildfire** *Grand Horizon Ballroom*
- Introduction by Rima Habre, University of Southern California
  - Ruben Juarez, University of Hawaii
  - Alika Maunakea, University of Hawaii
- 1:45pm **Lessons from Survivors: Insights from the Department of Angels' Community Voices: LA Fire Recovery Report** *Grand Horizon Ballroom*
- Introduction by Joseph Allen, Harvard T.H. Chan School of Public Health
  - Christine Kwon, Department of Angels
  - Andrew King, Department of Angels
- 2:30pm **Lightning Talks** *Grand Horizon Ballroom*
- Moderated by Kari Nadeau, Harvard T.H. Chan School of Public Health
  - "Airborne imaging spectroscopy applications for wildland-urban interface wildfires," by Megan Ward-Baranyay, NASA JPL and San Diego State University
  - "Drones, AI-enabled damage mapping, and open post-fire datasets," by Jaqueline Zdebski, University of Washington, NHERI RAPID Facility
  - "Assessing the impact of zero-zone vegetation on post-fire structural loss," by R. Willow Coleman, UCLA Department of Geography
  - "Less home damage, more health harms: Trade-offs of active home defense during the LA Fires," by David Eisenman, UCLA David Geffen School of Medicine and the Fielding School of Public Health, Center for Healthy Climate Solutions
  - "Housing and employment disruption and health impacts," by Patrick Smith, UCLA Division of General Internal Medicine and National Clinical Scholars Program
  - "Adverse mental health effects of the 2025 Los Angeles Wildfire Disaster: A difference-in-difference analysis," by Jiawen Liao, USC Keck School of Medicine
  - "Marine water quality responses to the Palisades and Eaton Fires across time," by Mia Franks, University of Southern California
- 3:15pm **Coffee Break** *North Promenade*
- 3:30pm **Research Collaborations for Impact: Case studies and brainstorming** *Grand Horizon Ballroom*
- Sujeet Rao, Public Exchange, University of Southern California (co-moderator)
  - Sarah Ali, R&S Kayne Foundation (co-moderator)
  - Savanna Carson, UCLA / LA Fire Health Study Community Advisory Board
  - Katy McNamara, CSUN / LA Fire Health Study Community Advisory Board
  - Andrew King, Department of Angels
  - Susan Cheng, Cedars-Sinai
  - Aaron Guggenheim, LA City Firefighters
  - Noelle Held, University of Southern California
  - Eugenia Ermacora, Surfrider Foundation
- 4:30pm **Research Awards & Reception** *North Promenade and Grand Horizon Ballroom*
- Awards presented by David Eisenmann and Kari Nadeau
- 6:00pm **Conference Ends**

# Research Poster Session Abstracts

## Environment & Exposures Research – *South Promenade*

### 1. Assessing Polycyclic Aromatic Hydrocarbons (PAHs) in the 50 Homes Exposure Study

Keith Acosta<sup>1</sup>, Parham Azimi<sup>1</sup>, Gen Pei<sup>1</sup>, Analise Hober<sup>1</sup>, Jean Zhou<sup>2</sup>, Elizabeth Ziyang Lin<sup>2</sup>, Zahra Keshavarz<sup>1</sup>, Jose Vallarino<sup>1</sup>, Krystal Pollitt<sup>2</sup>, Joseph G Allen<sup>1</sup>

<sup>1</sup> Harvard T.H. Chan School of Public Health, Harvard University

<sup>2</sup> Yale School of Public Health, Yale University

**Background:** Catastrophic wildfires in the greater Los Angeles (LA) area on January 7, 2025—including the Palisades and Eaton Fires—burned more than 37,000 acres, destroyed over 16,000 buildings, and exposed millions of residents to unhealthy air. Wildfire smoke contains pollutants such as polycyclic aromatic hydrocarbons (PAHs), yet current public health limits are based on outdoor measurements and do not fully account for indoor exposures or vapor phase PAHs. As part of the 50 Homes Exposure Study, within the broader LA Fire HEALTH Study, we collected airborne and dust PAH samples in homes across LA County following the 2025 wildfires to better understand residential exposure during wildfire events. **Hypothesis:** We hypothesized that homes situated closer to burned areas or that had not yet been cleaned would show elevated PAH levels in airborne particles and surface dust, with some concentrations potentially exceeding existing standards. **Methods:** Air (outdoor and indoor) and dust samples were collected from 50 homes across LA County. Field measurements occurred from February 10 to April 1, 2025. Information collected for all homes included distance from fire (within/adjacent to/more than 3 km from burn area), occupancy, cleaning status, and damage conditions. We used gas chromatography-mass spectrometry (GC-MS) to separate, identify, and quantify analytes. A seven-point calibration curve (0 to 1000 pg/μL) was determined for each compound, then applied for quantification for a total of 19 PAHs. **Results:** For 16 of 19 PAHs, mean indoor airborne levels exceeded outdoor levels. Dust wipe samples overwhelmingly showed high naphthalene concentrations in all homes sampled (DF: 100%, Median: 1,815,459 μg/m<sup>2</sup>). **Conclusion:** Our findings indicate substantial infiltration of wildfire smoke into living spaces following the LA wildfires.

### 2. Chemical Characteristics and Oxidative Potential of Urban PM<sub>10</sub> during the January 2025 Southern California Wildfires

Yashar Aghaei<sup>1</sup>, Mohammad Mahdi Badami<sup>1</sup>, P. S. Ganesh Subramanian<sup>2</sup>, Vishal Verma<sup>2</sup>, Talal Chatila<sup>3</sup>, Constantinos Sioutas<sup>1</sup>

<sup>1</sup> Department of Civil and Environmental Engineering, University of Southern California

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<sup>3</sup> Harvard Medical School, Division of Immunology, Boston Children's Hospital

The January 2025 wildfires in Southern California, driven by the Palisades, Eaton, and Hughes fires, marked an important shift in wildfire behavior, with intense smoke intruding directly into densely populated urban areas. These events offered a unique opportunity to examine how large-scale biomass burning influences air quality in Los Angeles. During the peak fire activity, airborne particulate levels increased markedly, reflecting the substantial influx of smoke into the basin. Chemical patterns during this period were strongly dominated by biomass-burning signatures. Markers such as potassium, levoglucosan, and a broad mixture of polycyclic aromatic hydrocarbons rose sharply relative to their typical urban background, highlighting the overwhelming contribution of fresh wood-smoke emissions. Carbonaceous species showed similar behavior, with both elemental and organic carbon exhibiting pronounced enhancements. The size distribution of particles during the fires shifted toward a bimodal structure, characterized by abundant fine particles formed through combustion processes and a coarse fraction derived largely from ash and resuspended debris. This altered size profile is consistent with large wildfire plumes and subsequent atmospheric processing within the urban environment. The oxidative potential of the aerosol, assessed through a chemical assay sensitive to redox-active components, increased substantially during the wildfire period. The strongest responses aligned with biomass-burning indicators, suggesting that smoke-derived particles carried a heightened oxidative

burden compared with non-fire conditions. Overall, these results illustrate how wildfire emissions can rapidly and profoundly degrade air quality in urban areas, increasing human exposure to chemically reactive particles with important implications for respiratory and cardiovascular health.

### 3. Metals in Outdoor Ash from the 2025 Eaton Fire

Isaac Natanael Aguilar<sup>1</sup>, Theo Tacail<sup>1</sup>, Mark Wrockiewicz<sup>1,2</sup>, Ceth Parker<sup>1,2</sup>, Francois L.H. Tissot<sup>1</sup>, George R. Rossman<sup>1</sup>, Merritt McDowell<sup>1</sup>, Julia V. Tejada<sup>1</sup>

<sup>1</sup> California Institute of Technology

<sup>2</sup> NASA Jet Propulsion Laboratory

The Eaton fire ignited on the evening of January 7, 2025, and tore through the Wildland-Urban Interface (WUI) for 24 days, leaving a burn scar of 14,021 acres in Altadena and the surrounding impacted neighborhoods. Intense katabatic winds with gusts up to 90 MPH recorded from Eaton Canyon exacerbated the disaster by exposing Los Angeles to ash fallout and decreased air quality. Beginning on January 16th, participating scientists and residents from the Caltech community collected ashes that had accumulated along impervious street curbs and sidewalks for assessing the elemental composition and environmental impacts of the 2025 Eaton fire ashes. The ash samples were prepared for analysis with X-Ray Fluorescence (XRF) and Inductively-Coupled Plasma Mass Spectrometry (I-CPMS) to measure the concentration of Lead, Arsenic, Zinc, and other elements of interest. Overall, ash composition was very heterogenous and variable with further analysis necessary for revealing fine-scale spatiotemporal patterns. A clear pattern of post-fire lead contamination was observed in the Altadena burn scar and in a narrow 2 km corridor at least 5 km southwest of the burn perimeter. Neighborhoods at the southwestern boundary of the Altadena burn perimeter are likely at a heightened risk of lead contamination from the legacy of lead-based products used in the construction of the historical neighborhoods that were damaged by the Eaton fire. Calibration standards for the Eaton Fire ashes will be essential for handheld, non-destructive exploration of ash toxicity and recovery monitoring in fire-impacted WUI landscapes.

### 4. Assessment of Particulate Matter and Comparative Analysis of Airborne and Surface Heavy Metals in 50 Homes after the LA Wildfires

Parham Azimi<sup>1</sup>, Zahra Keshavarz<sup>1</sup>, Gen Pei<sup>1</sup>, Kari Nadeau<sup>1</sup>, Joseph G. Allen<sup>1</sup>

<sup>1</sup> Harvard T.H. Chan School of Public Health, Harvard University

**Background:** The 2025 Los Angeles wildfires caused major destruction and released airborne pollutants that spread well beyond the burn area, raising concerns about environmental quality. As part of the L.A. Fire HEALTH Study, the 50-Homes Exposure Study was designed to characterize post-wildfire environmental conditions across LA County and provide data for future exposure and health risk evaluations. **Hypothesis:** We hypothesized that homes closer to burned areas or not yet cleaned would show higher concentrations of particulate matter and heavy metals in airborne particles and surface dust. **Methods:** From February to April 2025, sampling campaigns were conducted at 50 homes varying in proximity to burned areas, occupancy status, and cleaning practices. We focused on exposure levels to particulate matter (PM) and concentrations of elements, including heavy metals, in airborne particles and dust samples. Indoor and outdoor PM<sub>2.5</sub> and PM<sub>10</sub> were measured using continuous monitors and gravimetric sampling, and airborne particles and surface dust were analyzed for heavy metals. **Results:** Outdoor PM concentrations were generally higher than indoor levels, though only a few homes exceeded EPA and California annual limits. Elevated concentrations of several elements (iron, nickel, and chromium) were observed in homes closer to burn areas, with nickel and chromium showing strong correlations suggestive of shared combustion sources. Lead showed the strongest correlation between airborne and dust samples. Although trends indicated higher pollutant loads in homes nearer the burn zone for some elements, these differences were not statistically significant. **Conclusion:** These findings provide early insights into pollutant distribution patterns following major wildfire events and highlight the importance of indoor–outdoor sampling frameworks for assessing community exposures and informing mitigation strategies.

## 5. PHOENIX: A Dense Sensor Network for Outdoor PM Monitoring in Altadena, CA after the 2025 Eaton Fire

Haroula Baliaka<sup>1</sup>, Coleen Roehl<sup>1</sup>, Nikos Kanakaris<sup>2</sup>, Manuel de la Torre Juarez<sup>1,3</sup>, Merritt McDowell<sup>1</sup>, Isaac Aguilar Rivera<sup>1</sup>, Théo Tacail<sup>1</sup>, François L.H. Tissot<sup>1</sup>, Vine Blankenship<sup>1</sup>, Sina Hasheminassab<sup>1,3</sup>, Tom Morrell<sup>1</sup>, Rima Habre<sup>4</sup>, Nga Lee Ng<sup>5</sup>, John Seinfeld<sup>1</sup>, Rick Flagan<sup>1</sup>, Paul Wennberg<sup>1</sup>

<sup>1</sup> California Institute of Technology

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<sup>5</sup> Georgia Institute of Technology

PHOENIX (Post-fire airborne Hazard Observation Environmental Network for Integrated Xposure-monitoring) is a dense outdoor air quality monitoring campaign established in Altadena, CA, following the January 2025 Eaton Canyon fire. PHOENIX consists of 28 moderate-cost commercial sensors with real-time PM<sub>2.5</sub> and PM<sub>10</sub> measurements at 1-minute intervals. The sensors are spaced approximately 1 km apart and are mounted on rooftops of schools, homes and businesses offering high spatial and temporal resolution information at the neighborhood scale. The network provides an assessment of local air quality during post-fire cleanup and recovery. Its establishment was especially timely, particularly given that PM<sub>10</sub> concentrations are heavily influenced by localized sources (e.g., fire debris and ash removal and transport) that are often missed by regional air quality monitors or pre-existing low-cost PM sensor networks (e.g. PurpleAir). Preliminary results show that while daily average PM levels remained within EPA regulatory limits, sensors detected sharp early-morning PM<sub>10</sub> spikes along major north-south roadways indicating potential resuspension of road dust. In addition, road dust samples collected in April, 2025 revealed elevated lead (Pb) concentrations, with 60% of samples exceeding California's residential screening level of 80 ppm. Here, we describe the quantitative capabilities of PHOENIX, initial findings, as well as other lessons learned over the first nine months of operation.

## 6. Real-Time Trace Element Insights from ASCENT during the 2025 Los Angeles Urban Wildfires

Haroula Baliaka<sup>1</sup>, Ryan X. Ward<sup>1</sup>, Sean M. Raffuse<sup>2</sup>, Can Barut<sup>3</sup>, Bradley Ries<sup>4</sup>, Yumeng Cui<sup>4</sup>, Roya Bahreini<sup>4</sup>, Sina Hasheminassab<sup>1,5</sup>, Ruizhe Liu<sup>3</sup>, Armistead G. Russell<sup>3</sup>, John H. Seinfeld<sup>1</sup>, Paul O. Wennberg<sup>1</sup>, Richard C. Flagan<sup>1</sup>, Nga Lee Ng<sup>3</sup>

<sup>1</sup> California Institute of Technology

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<sup>5</sup> NASA Jet Propulsion Laboratory

Urban wildfires are an emerging air quality threat across the western United States, and real-time chemical composition data of urban fire plumes are vital for evaluating health impacts. The Eaton Canyon (Altadena) and Palisades firestorms in Los Angeles, which ignited in January 2025, led to widespread combustion of synthetic materials, raising concerns about the toxicity of the fine particulate matter (PM<sub>2.5</sub>). Real-time, high-resolution measurements, from the Los Angeles Atmospheric Science and Chemistry Measurement NeTwork (ASCENT) site in Pico Rivera (14 miles downwind of Altadena) captured the plume, during which certain elements exhibited enrichment ratios far above background levels, with sharp spikes observed for Cl, Br and certain metals such as Pb. Moreover, we compare these observations to elemental data from a recent wildland fire in the Los Angeles Basin and demonstrate clear distinctions between the two chemical mixtures. We apply Positive Matrix Factorization source apportionment to disentangle background levels from fire-related enhancements and to identify distinct chemical fingerprints associated with the combustion of urban materials. To assess regional impacts, we also integrated data from additional ASCENT sites in Rubidoux, Riverside, and Joshua Tree into a spatial modelling framework. Our findings underscore the importance of real-time measurements and reveal that when cities burn, the atmosphere becomes infused with a complex chemical cocktail introducing a new dimension to the challenges posed by wildfire air pollution.

## 7. Lead and Polycyclic Aromatic Hydrocarbon Concentrations from the Eaton Fire

Denise V. Berg<sup>1</sup>, Jennifer M. Cotton<sup>1</sup>, Scott C. Hauswirth<sup>1</sup>, Priya M. Ganguli<sup>1</sup>

<sup>1</sup> California State University, Northridge

The Eaton Fire scorched over 14,000 acres and destroyed over 9,000 structures, releasing ash and debris that sparked concern about possible lead contamination in Altadena, Pasadena, and other nearby communities. To assess post-fire lead concentrations and potential transport, we collected surface soil, mulch, and ash samples from 24 residential properties within or near the burn perimeter as well as from downwind public parks. Incremental depth profile soil samples from two residences were used to compare legacy versus more recent contamination. A total of 54 samples were analyzed for lead using an aqua regia digestion and the iCAP RQ Inductively Coupled Plasma Mass Spectrometer (ICP-MS). More than half of residential surface soils (9/17) exceeded California's 80 ppm screening threshold, and two surpassed the EPA's 200 ppm level. In contrast, only four of eleven park soils exceeded 80 ppm, and none exceeded 200 ppm. Mulch samples showed no values above 200 ppm, though two parks surpassed 80 ppm. Depth profiles revealed buried legacy contamination, and pre-fire/pre-rain soils (64–79 ppm) were comparable to post-fire concentrations at one site. Overall, lead levels were variable. However, higher concentrations were observed in residential properties close to or within the burn perimeter, while public parks had lower concentrations.

## 8. Satellite Observations Reveal NO<sub>x</sub> and CO Emissions from the 2025 Los Angeles Wildfires

Julianna Christopoulos<sup>1</sup>, Pablo E. Saide<sup>1,2</sup>

<sup>1</sup> Department of Atmospheric and Oceanic Sciences, University of California, Los Angeles

<sup>2</sup> Institute of the Environment and Sustainability, University of California, Los Angeles

In early January 2025, the Palisades and Eaton Fires produced some of the most destructive winter wildfires in recent Southern California history, burning more than 57,000 acres and heavily degrading air quality across the Los Angeles Basin. These fires released large amounts of gases and smoke that mixed with ongoing urban pollution, offering a unique opportunity to quantify how wildfires elevate emissions in a densely populated region. We use satellite measurements from both low-Earth orbit (LEO) sensors such as TROPOMI, which provide once-daily snapshots, and geostationary (GEO) sensors such as TEMPO, which observe the same location continuously throughout the daytime. Together, these complementary perspectives allow us to track the evolving wildfire plumes. Using a plume detection algorithm and a top-down emission approach (Cross-Sectional Flux), we derive preliminary estimates of nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO) released by the fires. On 7 January, clear conditions reveal hourly Palisades Fire NO<sub>x</sub> emissions of ~5 kg s<sup>-1</sup>, consistent with independent estimates based on the radiative energy released by the fires as observed from space. For context, after the fire period (12 January), retrieved NO<sub>x</sub> emissions fall to ~1–2 kg s<sup>-1</sup> hourly. CO emissions show a substantial fire influence, with combined Palisades and Eaton fluxes reaching ~800 kg s<sup>-1</sup> on 9 January. Overall, these preliminary findings demonstrate how combined LEO/GEO satellite observations can be used to quantify wildfire emissions within a complex urban–wildland environment and will guide upcoming air quality modeling of this extreme event.

## 9. Toxic Metal Contamination in Residential Soils after Urban Wildfires: Evidence from Cr(VI) and CAM17 Metals

Myra Farooq<sup>1</sup>, Nouh Sepulveda<sup>1</sup>, Sanjay Mohanty<sup>1</sup>

<sup>1</sup> SEALab, University of California, Los Angeles

Wildfires in the wildland–urban interface are becoming more frequent and severe, raising concerns about toxic metal formation in residential soils. Chromium is especially important because its hexavalent form [Cr(VI)] is soluble, mobile, and carcinogenic. This study investigates whether the 2025 Eaton and Palisades wildfires in Los Angeles elevated Cr(VI) concentrations in residential soils and whether debris and topsoil scraping lowered contamination levels. Based on prior work showing that high fire temperatures can oxidize Cr(III) to Cr(VI), we hypothesized that wildfire heating would increase Cr(VI) in surface soils, with

concentrations influenced by terrain, site history, and cleanup practices. Soils were collected from burned homes (scraped and not scraped), standing homes, and non-burned reference sites. Composite surface samples were extracted with phosphate buffer and analyzed by ICP-MS following EPA guidance. Statistical comparisons were conducted using Mann–Whitney U tests. Median Cr(VI) concentrations in Altadena (0.22 mg/kg) and Palisades (0.12 mg/kg) were below the EPA residential screening level of 0.95 mg/kg but frequently exceeded the more stringent California screening level of 0.3 mg/kg. Elevated concentrations occurred in burned-home perimeters, standing homes, and even some scraped soils. Scraping reduced Cr(VI) by roughly half but did not consistently lower concentrations below the state threshold. Finer soil fractions (<75  $\mu\text{m}$ ) showed the highest Cr(VI), indicating greater mobility and inhalation risk. Terrain also influenced outcomes, with higher concentrations in lower-slope Altadena soils. Overall, the findings demonstrate that wildfires increased Cr(VI) in residential soils and that common remediation practices, while helpful, do not always eliminate health risks. These results support targeted post-fire monitoring and site-specific remediation strategies.

## 10. Analysis of Indoor Air Quality in 600 Homes during The 2025 Los Angeles Urban Wildfire

Lauren Ferguson<sup>1</sup>, Gen Pei<sup>1</sup>, Parham Azimi<sup>1</sup>, Zahra Keshavarz<sup>1</sup>, William Kessler<sup>1</sup>, Joseph Allen<sup>1</sup>

<sup>1</sup> Harvard School of Public Health, Harvard University

**Background:** The 2025 Los Angeles Urban Wildfires produced some of the most severe urban smoke conditions in recent California history. Indoor fine particulate matter (PM<sub>2.5</sub>) during wildfire smoke events is influenced by the infiltration of outdoor pollution. Housing characteristics—such as building age, size, and ventilation—may modify indoor smoke exposure, but large-scale evidence is limited. **Methods:** Using a novel dataset of indoor air quality measurements collected before, during, and after the 2025 LA Urban Wildfires, we analyzed 1.99 million hourly PM<sub>2.5</sub> observations from approximately 600 homes across the Greater Los Angeles metropolitan area. Linear mixed-effects models were used to estimate indoor PM<sub>2.5</sub> concentrations as a function of outdoor PM<sub>2.5</sub>, wildfire activity, indoor environmental variables, building air exchange rates, and neighborhood-level housing characteristics. Home ventilation was estimated using the CO<sub>2</sub> decay method, where the rate of CO<sub>2</sub> decline is quantified over time once occupancy-related sources cease, to produce a distribution of air change rates (ACH) for each home. **Results:** Throughout the sampling period, 90% of the indoor PM<sub>2.5</sub> data was in the range of 0.1 – 29.5  $\mu\text{g}/\text{m}^3$ , with the sample mean  $\sim 1$   $\mu\text{g}/\text{m}^3$  higher during active fire periods (9.66  $\mu\text{g}/\text{m}^3$  vs. 10.7  $\mu\text{g}/\text{m}^3$ ). Higher residential ACH was independently associated with higher indoor PM<sub>2.5</sub> ( $\beta = 0.082$ ,  $p < 0.001$ ) and during wildfire periods (ACH  $\times$  wildfire:  $\beta = 0.011$ ,  $p < 0.001$ ), indicating leakier homes experienced larger increases in indoor PM<sub>2.5</sub> during smoke events beyond the baseline wildfire effect. Indoor PM<sub>2.5</sub> ranged from 7.2  $\mu\text{g}/\text{m}^3$  in homes with low ACH to 8.7  $\mu\text{g}/\text{m}^3$  in homes with high ACH during wildfire-driven high outdoor air pollution events (2SD above mean  $\sim 58$   $\mu\text{g}/\text{m}^3$ ). **Conclusion:** Findings highlight the importance of high-efficiency air filtration, home weatherization, and targeted public health guidance for reducing wildfire smoke exposure in residential environments. Low-cost sensors can derive meaningful insights into real-world exposure patterns, informing building-level resilience strategies.

## 11. Distribution and Bioaccessibility of Lead in Soils Resulting from the 2025 Los Angeles Fires

Mia Gabriel<sup>1</sup>, Ratish Ragavendiran<sup>1</sup>, Christine O'Connell<sup>1</sup>, Christopher Kim<sup>1</sup>

<sup>1</sup> Chapman University

Wildland-urban interface (WUI) fires have increased in prevalence in recent years, posing both immediate and long-term threats to environmental and human health. Fire-related soil contamination by metals is a particular area of focus resulting from the 2025 LA Fires. Soil sampling was conducted approximately 1, 6, and 12 months post-containment of the 2025 Eaton wildfire, sampling 10 burned and 10 unburned residential lots. Soil samples were collected at depths of 0–1 cm, 1–5 cm, and 5–10 cm, from sections of highest surface lead concentrations measured in situ at each lot using a handheld XRF spectrometer. Samples were air-dried in a fume hood, sieved to  $\leq 250$   $\mu\text{m}$  (ingestible particle-size fraction), and then exposed to a simulated gastric fluid (SGF) extraction to simulate the effect of incidental ingestion of the Eaton soil samples, from which lead mobility/bioaccessibility was assessed as a function of depth and time. One-month post-fire results indicate elevated levels of lead initially present and leached from the 0-1 cm layer of burned lots, suggesting contamination due to lead-enriched ash and combustion debris. Lower lead releases were observed in the 1-5 cm and 5-10 cm soil fractions from both burned and

unburned lots, indicating minimal/no impact of fires on subsurface soils. In burned lot soils, decreasing lead bioaccessibility and variability was observed as a function of depth, while unburned lots showed relatively constant bioaccessibility across all depths. These findings, with the addition of forthcoming comparisons with soils collected 6- and 12- months post-fire, will demonstrate how lead concentration and bioaccessibility evolve with time and depth within a soil profile.

## 12. Post-Fire Persistence of Heavy Metals in Residential Soils: Spatial Patterns and Property-Specific Variability

Frida D. Garcia Ledezma<sup>1</sup>, Alirezah Namayandeh<sup>1</sup>, Charlie Lamb<sup>1</sup>, Scott Fendorf<sup>1</sup>

<sup>1</sup> Earth Systems Science, Stanford University

Wildland-urban interface (WUI) regions present complex environmental and public health challenges that become particularly acute following wildfire events. Smoke, ash, and embers generated during these fires can be transported into residential areas, where they damage infrastructure and deposit hazardous contaminants into surrounding soils. The 2025 Eaton Fire in Pasadena, CA, underscores these vulnerabilities. Initiating in Eaton Canyon, the fire rapidly advanced into adjacent neighborhoods, destroying structures and mobilizing toxic metals released from burning buildings, household materials, and vehicles. Once airborne, these metals dispersed across residential properties and subsequently settled into surface soils, heightening concerns regarding long-term human exposure and environmental persistence. This study investigates the enrichment, distribution, and persistence of heavy metals (HMs) in soils affected by the Eaton Fire using a high-resolution, house-by-house sampling approach. Over the span of one year, soil was collected from burned and smoke-impacted properties to assess contaminant persistence, the effectiveness of remediation efforts, and seasonal shifts during the rainy season. Additional samples were taken from household debris, electric vehicles, and appliances to identify source contributions from common anthropogenic materials. This fine-scale sampling strategy allowed us to map property-level metal distributions, identify specific pollution sources, and track concentration changes over time, with particular focus on lead. Lead concentrations varied widely, ranging from below 50 ppm to more than 1000 ppm, with the highest values commonly located near burned vehicles, deteriorated exterior walls containing legacy lead-based paint, and other structural remnants. Although remediation generally reduced contamination, elevated levels persisted in locations that were neither capped nor excavated. Using these data, we are also developing property-specific risk assessments to identify areas with the greatest contamination and potential exposure concerns. Collectively, these findings improve our understanding of post-fire soil contamination and support more effective public health guidance and remediation planning for communities in the WUI.

## 13. Post-Wildfire Indoor Pollution in WUI Areas: Establishing Baseline Contaminant Levels Before Home Reoccupation

Ehsan Goftari<sup>1</sup>, Jose Carias<sup>1</sup>, London Fulford<sup>1</sup>, Hanyang Li<sup>1</sup>

<sup>1</sup> San Diego State University

As urban areas continue to expand, more people are living in or near wildland regions, known as the Wildland-Urban Interface (WUI), which has significantly increased communities' exposure to WUI fire hazards. To characterize toxic emissions and environmental concentrations in homes impacted by the 2025 WUI fires in Los Angeles (Eaton and Palisades fires), we performed a combination of indoor air quality measurements of particulate matter, black carbon, total volatile organic compounds, speciated toxic metal particulates using TARTA, and outdoor PM concentrations, as well as collecting wipe samples from indoor floors and surfaces contaminated with ash and soot. Following the fire, the homes located next to a burned structure had higher indoor concentrations of PM<sub>2.5</sub> (average of 6.48 µg/m<sup>3</sup>), PM<sub>10</sub> (average of 102.86 µg/m<sup>3</sup>), and black carbon (average of 774 ng/m<sup>3</sup>) than homes farther away from the fire or those that had been professionally cleaned. In terms of airborne metals, the average indoor concentrations of iron and copper over all the sampled homes were 60.59 and 3.92 ng/m<sup>3</sup>, respectively. Most metals were either below U.S. EPA reference inhalation concentrations or below the detection limits of our instrument. While airborne metal levels were not high, the wipe samples revealed elevated concentrations of toxic metals, especially lead. In 75% of sampled homes, surface lead levels were above the EPA's safety limit of 5 µg/ft<sup>2</sup>. These findings offer important data as indoor dust particles can be resuspended and become airborne during cleaning and remediation activities and pose risks to human health. The current phase of this study involves distribution of nearly 150 Airthings indoor PM sensors to the homeowners in fire-affected areas to continuously examine air pollutant dynamics

throughout the post-fire recovery timeline during re-entry and reconstruction, as well as the long-term persistence of indoor contamination.

#### 14. Community-Level Assessment of Ambient Particulate Matter, Black Carbon, and Metals during Debris Removal and Recovery Following the 2025 Eaton Fire

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Wildland–urban interface (WUI) fires present unique air quality challenges, not only during active burning but also throughout post-fire cleanup and recovery. Following the 2025 Eaton Fire, we deployed three monitoring sites in and around Altadena to assess outdoor particulate matter (PM), black carbon (BC), and metals levels during the cleanup and recovery phases. These sites, also part of Caltech’s PHOENIX network, included a background location at the Jet Propulsion Laboratory (JPL), a school near the burn perimeter, and a roadside site along a designated debris haul route (Woodbury). From March to August 2025, daily average PM<sub>2.5</sub> and PM<sub>10</sub> generally remained within the “good” to “moderate” AQI range, and BC levels were comparable to those observed elsewhere in Los Angeles. PM<sub>10</sub> exhibited the strongest spatial gradient, with concentrations at Woodbury 1.5 to 2.5 times higher than at the School and JPL sites. PM<sub>2.5</sub> and BC were also elevated at Woodbury, though to a lesser extent. These enhancements were attributed primarily to dust resuspension and diesel emissions associated with debris removal and increased truck traffic. Background-normalized pollutant levels at the School and Woodbury sites declined steadily from March to August, consistent with reduced cleanup activity and truck traffic over time. Metals monitoring at the School site revealed elevated barium, bromine, and silicon, mainly attributed to increased traffic emissions, heavy equipment activity, and dust resuspension in Altadena. Together, these findings underscore the importance of localized monitoring beyond regulatory networks and provide critical insights into community exposure risks during WUI recovery.

#### 15. Evaluation of Smoke Exposure Risk from January 2025 Los Angeles Wildfires Using Crowdsourced Data

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Wildfire smoke is an increasingly significant contributor to air pollution in the western United States, posing serious health risks and complicating efforts to assess personal exposure, particularly indoors. The January 2025 Palisades and Eaton Fires in Los Angeles County caused elevated levels of PM<sub>2.5</sub> in downwind cities. This study leverages a high-resolution network of crowdsourced PurpleAir sensors to evaluate indoor and outdoor PM<sub>2.5</sub> levels before, during and after the wildfire smoke events. We matched indoor-outdoor sensor groups and analyzed disparities in smoke exposure across communities with different CalEnviroScreen vulnerability scores, ventilation types, and home values. Results indicate that communities with higher environmental and socioeconomic burdens experienced greater indoor PM<sub>2.5</sub> levels during and after smoke days. Mechanical ventilation systems offered no significant advantage during smoke days, though they were associated with higher I/O ratios post-fire. Lower priced homes had elevated indoor PM<sub>2.5</sub> levels after the wildfire event, reflecting potential disparities in building infrastructure and filtration capacity. These findings highlight the interplay between behavioral actions and structural capacity in shaping wildfire smoke exposure and underscore the need for targeted interventions to improve indoor air quality in vulnerable communities.

## 16. Airborne Metallic Nanoparticles Associated with Debris Removal from the Los Angeles Wildfires in 2025

Michael Kleeman<sup>1</sup>, Christopher Cappa<sup>1</sup>, Peter Green<sup>1</sup>, Yuejun Zhou<sup>1</sup>, Mohammad Astaneh<sup>1</sup>, Sunny Kant<sup>1</sup>

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The Eaton and Palisades wildfires in January, 2025, destroyed more than 18,000 structures across two major cities in Southern California. The cleanup from this disaster in close proximity to the 18M nearby residents poses an unprecedented air quality and public health challenge. The US Army Corps of Engineers and private contractors removed an estimated 4.5 million metric tons of debris requiring approximately 100,000 dump truck trips from the debris zone to local landfills. Dust mitigation measures including wetting debris during loading, tarping trucks, and washing streets were largely successful, but the scale of the operations means that even a small percentage of fugitive emissions can have significant air quality impacts. This presentation will review measurements of airborne particulate matter measurements spanning 7 months (March – September, 2025) of cleanup operations with a focus on concentrations of nanoparticle metals. Particle signatures unique to the debris cleanup zone will be identified and linked to sources where possible. Measurements in the debris cleanup zones will be put into context relative to the broad array of measurements made by other research groups and regulatory agencies. Implications for public health will be discussed along with recommendations for future research.

## 17. PM Exposure Associated with Burned Buildings during the Los Angeles Wildfires in 2025

Michael Kleeman<sup>1</sup>, Sean Raffuse<sup>1</sup>, Sunny Kant<sup>1</sup>, Colette Schissel<sup>2</sup>, David Allen<sup>2</sup>

<sup>1</sup> University of California, Davis

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The wildfires that occurred in Los Angeles during January 2025 were among the most destructive in the history of California. Approximately 57,000 acres burned, consuming more than 18,000 structures and resulting in 30 deaths. The urban nature of the fire generated significant concentrations of toxic compounds in the wildfire smoke, including lead, arsenic, and halogenated compounds associated with burned metals, plastics, and other building materials. The ash and soil within and around the wildfire zones was also enriched in toxic compounds, raising the possibility that debris removal and cleanup over a period of months could expose the ~18M nearby residents of Los Angeles to further levels of toxic air pollution. This presentation will discuss methods used to predict air pollution exposures during both the active burning phase and cleanup phase of the wildfire using a source-oriented chemical transport model (CTM). During the burning phase, wildfire emissions based on satellite observations of fire boundaries will be combined with other air pollution emissions to predict how smoke will age in the atmosphere. During the cleanup phase, measured size and composition distributions of dust generated in the burned zone will be used to model deposition rates for different toxic compounds contained in the PM. The ability of the CTM to reproduce measured PM concentrations during and after the wildfire event will be evaluated. Tagging features within the CTM will be used to quantify wildfire contributions to ambient PM separated from other sources. Wildfire contributions to ultrafine, fine, and coarse particle PM will be discussed.

## 18. Evaluation of Airborne Particles in and around Office Building Spaces during the Los Angeles Wildfires

Juliane Kwong<sup>1</sup>, Seongjun Park<sup>2</sup>, Sarah Kim<sup>1</sup>, Marilyn Mendez<sup>1</sup>, Wasay Warsi<sup>1</sup>, Gen Pei<sup>2</sup>, Parham Azimi<sup>2</sup>, Susan Cheng<sup>1</sup>, Joseph G. Allen<sup>2</sup>, Sandy Joung<sup>1</sup>

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**Background:** Air quality was adversely affected in and around office work environments following the onset of the Los Angeles fires. Understanding the potential health relevant exposures requires characterizing the extent to which urban air quality was altered inside, outside, and in mixed indoor-outdoor building environments during this time period. **Methods:** We used high efficiency particular air filtration devices to capture airborne particulate matter that was circulating in and around an office building environment located approximately 10 miles from the Palisades fire and approximately 20 miles from the Eaton fire. Our devices were configured to capture airborne particles continuously for a total of 72 hours, beginning on January 16, 2025.

We used X-ray fluorescence spectroscopy to identify and quantify metalloid accumulation in the collected samples. **Result:** We found evidence of metalloid accumulation from samples collected across all areas studied. In particular, iron levels were elevated in the outdoor samples compared to indoor and mixed area samples. Notably, for several other metalloids (mercury, molybdenum, zinc, and selenium) levels were higher in the outdoor than indoor samples but highest overall in the mixed area samples. By contrast, levels of strontium were overall highest in indoor samples. **Conclusion:** Multiple distinct metalloids were found in circulating air samples collected within ten days following onset of the Los Angeles fires. Many metalloids, including those known to be harmful to human health, were observed in excess concentrations particularly in the mixed indoor-outdoor areas where overall air flow and ventilation can be limited.

## 19. Metal Concentrations in Wind-Dispersible Surface Dust Following the 2025 Los Angeles Fires

Jing Li<sup>1</sup>, Qiyue Nie<sup>1</sup>, Yuan Yao<sup>1</sup>, Haoxuan Chen<sup>1</sup>, Priscilla Boo<sup>1</sup>, Qiao Yu<sup>1</sup>, Muchuan Niu<sup>1</sup>, Yifang Zhu<sup>1</sup>

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The January 2025 Palisades and Eaton Fires destroyed approximately 18,000 structures, potentially releasing large amounts of metals into the environment. However, limited data exist on metal concentrations in wind-dispersible surface dust following such events. We collected 45 dust samples from areas surrounding the two fires in LA County between January 14 and February 11. Dust was brushed from outdoor surfaces (e.g., mailboxes, windowsills, benches, tables) using anti-static brushes and analyzed for 14 metals, including lead (Pb), arsenic (As), cadmium (Cd), and chromium (Cr), reported in ng/mg (ppm). Sampling locations were mapped against smoke plumes from the first active fire week (January 7–13) using the NOAA Hazard Mapping System, which classifies plume density as heavy, medium, light, or none. Each location was assigned to a low-impact group ( $\leq 2$  heavy plume days) or high-impact group ( $\geq 3$  heavy plume days). Results showed that most metal concentrations in dust were below established soil screening levels. However, levels of As, Cd, Co, Cu, and Pb exceeded their respective screening values in multiple samples. Because dust, rather than soil, was measured, exceedances do not directly indicate health risk but signal the need for further assessment. Locations with  $\geq 3$  heavy smoke days had significantly higher concentrations of As, Cd, and Cu than low-impact sites; Co, Cr, Ni, Sb, and Zn were also marginally elevated. These patterns suggest that wildfire smoke contributed to increased metal levels in surface dust and highlight metals that warrant closer monitoring.

## 20. Fungal Inoculation as a Potential Post-Fire Mitigation Tool for Heavy Metal Contamination

Olivia Lucas<sup>1</sup>, Nicole Kouyoumdjian<sup>1</sup>, Zach Jennings<sup>1</sup>, Brenton Spies<sup>1</sup>, Sean Anderson<sup>1</sup>, Timnit Kefela<sup>1</sup>

<sup>1</sup> California State University, Channel Islands

The January 7th, 2025 Eaton Wildfire, strengthened by the 100 mph Santa Ana winds, rapidly morphed into an extensive urban fire that burnt a variety of infrastructure, including residential properties and commercial buildings. At its conclusion, the fire, which spanned 5,666 hectares, deposited smoke, soot, and char across the entirety of Altadena; including properties that escaped direct damage or destruction. Altadena residents now face uncertainty and health concerns as they try to rebuild sites whose original infrastructure predated the Safe Drinking Water Act, the transition from lead-based plumbing, and lead and arsenic-based paints. Combustion of these materials in the Eaton Fire likely released heavy metal contaminants into the surrounding soils, above and beyond set EPA limits, giving cause for health and safety concerns. We quantified trace metal concentrations (via CAM-17 protocols) in Altadena soils with a particular focus on potential lead and arsenic exposure to homeowners. We sampled residential properties certified “clean” via Final Clearance Letters or Cleanup Completion Certificates by the US Army Corps of Engineers beginning in July of 2025 (with repeated samplings at 90 day intervals). We also piloted a low-cost mycoremediation employing *Pleurotus ostreatus* mycelium via on-site application for potential reduction of metal concentrations over the coming year. Preliminary work suggests elevated levels of anthropogenic materials persist on properties cleared for rebuilding. We present heavy metal concentrations across 11 sites and field-scale fungal colonization plot results to assess effects and potential utility of mycoremediation for wildfire-recovery frameworks, prioritizing environmental and public health.

## 21. Eaton Fire Indoor Contamination Post-Remediation: Six in Ten Homes Unsafe to Inhabit

Nicole Marie-Gerardi MacCalla<sup>1</sup>, Jane Lawton Potelle<sup>1</sup>, Dawn Fanning<sup>1</sup>

<sup>1</sup> Eaton Fire Residents United

Eaton Fire Residents United (EFRU) is a coalition of concerned residents formed in the wake of the January 2025 Eaton Fire. Our mission is to ensure a safe, just, and transparent public health recovery process for the Eaton Fire-affected community. We use data to drive our work. While many homes did not burn, they were inundated with toxic ash carried by the wind, impacting residents miles away from the fire itself. Residents are now facing various health and safety concerns in the aftermath of the fire. The EFRU-created interactive maps display reported contamination levels of Eaton Fire-generated heavy metals and pollutants in the interiors of standing structures, as tested by professional companies before and after remediation. Our most recent analysis examined the extent to which wildfire debris, asbestos, lead, and other heavy metals were eliminated and/or reduced to acceptable levels after remediation. 69% still tested positive for wildfire debris; 36% still test positive for asbestos; 96% of homes still test positive for lead - 63% of those homes test above EPA screening thresholds for lead on floors, and 50% tested above EPA screening thresholds for lead on windowsills. CAM-17 metals, also known as heavy metals, can cause kidney and liver damage, neurological damage, diabetes, cancer, and other health crises. Four Heavy Metals – Chromium, Barium, Copper, and Zinc – tested positive 100% of the time. Of those homes. Looking across contaminants with established indoor residential screening levels, 6 out of 10 remediated homes remain uninhabitable due to lead and/or asbestos levels.

## 22. Heavy Metal Analysis in Dust from the 2025 Eaton Canyon Fire

Merritt C. McDowell<sup>1</sup>, Théo Tacail<sup>1</sup>, François L. H. Tissot<sup>1</sup>

<sup>1</sup> California Institute of Technology

## 23. Detailed VOC Exposure Source Apportionment Indoors and Outdoors Based on Vocus Chemical Ionization Mass Spectrometry

Pawel Misztal<sup>1</sup>, Daniel Sung<sup>1</sup>, Evelyn Deveraux<sup>1</sup>, Albert Kyi<sup>1</sup>, Anna Neville<sup>1</sup>, Chou-Hsien Lin<sup>1</sup>, Kat Konnon<sup>1</sup>, Shihao Zhai<sup>1</sup>, Lea El Khoury<sup>1</sup>, Lea Hildebrandt Ruiz<sup>1</sup>

<sup>1</sup> University of Texas at Austin

**Background:** The January 2025 Los Angeles fires resulted in widespread exposure to complex gas-phase emissions from diverse combustion sources including residential structures, vehicles, batteries, and vegetation. Understanding the chemical composition and sources of volatile organic compounds (VOCs) is critical for assessing health risks and informing recovery efforts in fire-affected communities. **Hypothesis:** High-resolution mass spectrometry can identify source-specific VOC markers and quantify their spatial and temporal distribution to characterize multi-source exposures indoors and outdoors in fire-affected areas. **Methods:** We employed proton-transfer-reaction time-of-flight mass spectrometry (Vocus PTR-TOF-MS) for laboratory experiments, mobile measurements in Pacific Palisades and Altadena (February and May 2025), and indoor/outdoor sampling at twelve residences. Factor analysis on the 614 most abundant VOC ions was used to identify emission sources. **Results:** Mobile measurements revealed elevated source markers in burn zones, including battery-specific (alkyl carbonates, triethyl phosphate), and combustion-specific molecules (e.g., polycyclic aromatic hydrocarbons), with decreased but detectable concentrations persisting four months post-fire. Factor analysis identified five primary source categories: (1) biomass combustion and household contents, (2) plastic pyrolysis, (3) fossil fuel combustion and traffic, (4) cleaning products and HVAC systems, and (5) rubber and metal degradation. Indoor/outdoor concentration ratios revealed source-specific infiltration patterns, and high indoor enrichment of indoor contaminants from burnt contents and cleaning activities in affected homes. **Conclusion:** This comprehensive chemical characterization provides critical insights into multi-source VOC exposures in fire-affected communities, supporting exposure assessment efforts and public health guidance for recovery operations.

## 24. Investigating Lead in Soils After the LA Fires: A Citizen Science Approach

Catherine Odendahl<sup>1</sup>, Max Teirstein<sup>2</sup>, Zach Alvarez<sup>1</sup>, Jessica Guerrero<sup>1</sup>, Nicolas Lam<sup>1</sup>, Joseph Rios<sup>1</sup>, Laura Zhang<sup>1</sup>, Kyeong Pil Kong<sup>1</sup>, Nismata Sigdel<sup>1</sup>, Adam Ross<sup>1</sup>, Katie Vega<sup>2</sup>, Mia Bradshaw<sup>1</sup>, Nataly Pineda<sup>1</sup>, Katherine Thomas<sup>1</sup>, Erika Garcia<sup>1</sup>, Sujeet Rao<sup>2</sup>, Sam Silva<sup>1</sup>, Josh West<sup>1</sup>, Seth John<sup>1</sup>

<sup>1</sup> University of Southern California

<sup>2</sup> Public Exchange, University of Southern California

Los Angeles (LA) experienced destructive wildfires in January 2025. The Palisades and Eaton fires burned over 57,000 acres of land and more than 15,000 homes and businesses. In the aftermath of the fires, there has been rising concern among impacted communities about lead and other contaminants delivered from fire ash. As members of the community and geochemists, we decided to start a community effort to test the soil of concerned citizens for total lead (Pb). The CLEAN project (Contaminant Level Evaluation & Assessment for Neighborhoods) is working to provide people with more information about the safety of their soil. Community members can drop off their sample to local establishments including libraries and community centers for pickup. Samples are then analyzed for Pb by X-ray Fluorescence (XRF) spectrometry. From this analysis, we obtain elemental data from magnesium to uranium. Data from this project will be shared with homeowners, and used to create anonymized neighborhood-scale maps of areas in which contamination from the fires poses the highest risks. We have found through statistical tests that there is a large difference in the lead levels from the Palisades burn zone vs. the Eaton Fire burn zone. We do not see a statistical difference in Pb levels within a given burn zone vs. a ring of 0-1 miles, vs. 1-5 miles, or vs. 5-10 miles, for either fire. We are currently working to explain the variance in data with different variables such as housing stock age and traffic patterns.

## 25. Looking Into the Post-Wildfire Soil Landscape: Early Insights on Mycoremediation of Arsenic and Lead

Valerie Paz<sup>1</sup>, Victor Melgoza<sup>1</sup>, Sean Anderson<sup>1</sup>, Stacy Anderson<sup>1</sup>, Brenton Spies<sup>1</sup>, Timnit Kefela<sup>1</sup>, Zach Jennings<sup>1</sup>

<sup>1</sup> California State University, Channel Islands

Anthropogenic-driven climate change has intensified wildfire activity across California, resulting in unprecedented burn scars over recent decades and widespread ecological and economical impacts. Degraded post-wildfire soils may function as contaminant sinks, accumulating toxic byproducts and heavy metals that persist in the environment and pose long-term risks to vegetation and human health. Remediation of those toxicants is often challenging, costly, and may fail to reduce toxicant levels below EPA SSLs. This is especially evidenced by rapid post-fire cleanup efforts following the 2025 Eaton Fire in Altadena, California. We therefore investigate mycoremediation with oyster mushrooms (*Pleurotus ostreatus*) as a potentially low-cost, scalable alternative for restoring heavy metal impacted soils. *Pleurotus* spp. possess complex mycelial networks and potent ligninolytic enzymes capable of bioabsorbing and sequestering heavy metals within fungal tissues, whose effective degrading of a diverse number of contaminants across various soil media is well-documented. Metal-enriched mushroom tissues harvested from soil matrices allow relatively easier metal concentration reduction within soil masses. We test the applicability of this mycoremediation system within the Altadena Community Garden via quantification of lead and arsenic concentrations across three soil treatments (densely mulched, sparsely mulched, and unmulched) inoculated with mycelium over time (pre-treatment, 90 days post-inoculation, and 180 days post-inoculation). We hypothesize that higher mulched, inoculated soils would show greater reduction of heavy metal concentrations due to improved substrate stability for fungal colonization and growth. Our findings aim to advance understanding of mycoremediation in post-wildfire contexts and contribute to development of sustainable initiatives for soil restoration and fire-impacted communities.

## 26. The Smoke That Stayed: Persistent Indoor Chemical Hazards from Urban Wildfires

Dong Gao<sup>1</sup>, Elizabeth Lin<sup>1</sup>, Parham Azimi<sup>2</sup>, Jean Zhou<sup>1</sup>, Inumidun Oyebo<sup>1</sup>, Zahra Keshavarz<sup>2</sup>, Rima Habre<sup>3</sup>, Joseph G. Allen<sup>2</sup>, Krystal J. Godri Pollitt<sup>1</sup>

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<sup>3</sup> Keck School of Medicine of University of Southern California

**Background:** Wildfires at the wildland-urban interface increasingly impact indoor and outdoor air quality on extended timescales, yet comprehensive chemical characterization of post-fire environments remains limited. **Hypothesis:** Indoor surfaces become primary sources of persistent chemical exposure through off-gassing of deposited wildfire-related compounds, with contamination patterns varying by proximity to burn zones. **Methods:** The LA Fire HEALTH Study deployed paired indoor/outdoor passive air samplers (Fresh Air Clips) across 30 standing homes in Pacific Palisades, Altadena, and other Los Angeles neighborhoods from February-April 2025 over 5-day periods. Non-targeted gas chromatography high-resolution mass spectrometry analysis was used to assess exposure profiles of volatile and semi-volatile organic compounds. **Results:** We detected 411 compounds with health concerns, including carcinogens, endocrine disruptors, and developmental toxicants. Indoor levels exceeded outdoor concentrations (185 vs. 8 compounds higher), with combustion products showing 3-10× indoor enrichment. Combustion products were detected in all homes 2-3 months post-fire, with homes >7 miles from fires showing only 1.2-1.6× lower levels than burn-zone residences. Distinct chemical fingerprints emerged by proximity: homes near burn zones showed combustion signatures from synthetic materials (pyridines, thiophenes, methylnaphthalenes, brominated flame retardants, organochlorine pesticides), while distant homes exhibited consumer product chemicals from uninterrupted daily activities (phenoxyethanol, pyrazines, phthalides). Standard remediation showed <20% reduction for most combustion products, with ventilation playing minimal roles. **Conclusion:** Urban wildfire smoke creates persistent indoor chemical hazards through surface reservoir formation. These findings support comprehensive porous material replacement and protecting vulnerable populations through improved building material standards, automated HVAC systems, and proactive contamination screening in fire-prone areas.

## 27. Characterizing the Spatial Distribution of Trace Metals on Impacted Residential Soils Post LA-Fires

Ratish Ragavendiran<sup>1</sup>, Mia Gabriel<sup>1</sup>, Christine O'Connell<sup>1</sup>, Christopher Kim<sup>1</sup>

<sup>1</sup> Chapman University

The 2025 LA fires exposed a critical knowledge gap regarding the concentration and spatial distribution of trace metals across impacted residential lots. Considerable heterogeneity in both variables is likely due to several factors including the combustion of metal point sources (i.e. household appliances, vehicles), the presence/absence of lead-based paint on older homes, smoke plume direction, and subsequent post-fire rain events and remediation efforts. To address this knowledge gap, a group of researchers from Chapman University (Orange, CA) collected extensive measurements at 20 homes in the Altadena area (10 burned and 10 unburned homes) at 1-, 6-, and 12-month time points post-fire. Grid-based yard analysis (n=30-40 per home) allowed representative soil measurements for a suite of metals using a handheld X-ray fluorescence (XRF) spectrometer (Bruker Tracer 5i or Niton XL5 Plus). Measurements were collected at the surface level and, for 50% of locations, at a depth of ~5 cm as a proxy for background pre-fire concentrations. Results demonstrate considerable surface soil enrichment in metals (specifically lead), likely due to ash and other burned debris, in the soils of burned lots. With increasing time post-fire, the distribution of elevated lead concentrations on burned lots appears to broaden, likely a result of point source contaminants transporting through wind, surface water runoff, and other possible anthropogenic disturbances. These findings, along with select grab samples collected at the most metal-enriched location at each lot, will enable better assessment of metal migration as well as potential metal exposure and bioaccessibility over time.

## 28. Studying Microplastics Abundance in Samples Collected from Homes Following a Southern California Wildfire

Hrithik Nath<sup>1</sup>, Anandu Nair Gopakumar<sup>1</sup>, Parham Azimi<sup>2</sup>, Zahra Keshavarz<sup>2</sup>, Mary Johnson<sup>2</sup>, Kari Nadeau<sup>2</sup>, Joseph G. Allen<sup>2</sup>, Maryam Salehi<sup>1</sup>

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## 29. Fine Spatial and Temporal Scale Fuel and Emissions Inventories for the Eaton and Palisades Wildland Urban Interface (WUI) Fires

Colette Schissel<sup>1</sup>, David Allen<sup>1</sup>, Morgan Meyer<sup>1</sup>, Emanuel Thompson<sup>1</sup>, Yosuke Kimura<sup>1</sup>, Shannon Stokes, Michael Kleeman<sup>2</sup>, Sean Raffuse<sup>2</sup>

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<sup>2</sup> University of California, Davis

The Eaton and Palisades fires in the Los Angeles area in January 2025 occurred at the Wildland Urban Interface (WUI) consuming structures, vehicles and vegetation. Structures and vehicles accounted for 67% and 62% of the estimated fuel loadings ( $1.60 \times 10^8$  kg and  $2.65 \times 10^8$  kg), and vegetation accounted for 33% and 38% of the fuel loadings ( $8.00 \times 10^7$  kg and  $1.63 \times 10^8$  kg) in the Eaton and Palisades burn zones, respectively. Fuel loading inventories were aggregated into 100 m by 100 m grid cells throughout the burn regions, with fuel loadings in individual grid cells ranging from 0 to  $2.85 \times 10^4$  kg for vegetation and 0 to  $1.4 \times 10^6$  kg for structures and vehicles. Temporal allocations of the fuel consumed were derived from initiation and duration estimates of the fires based on satellite data, augmented by local reporting. Emissions from the combustion of the fuels were estimated based on multiple emission factor approaches. A base case emission inventory was constructed using average emission factors for structures and vehicles and a widely used tool (Bluesky) for estimating emissions from combustion of vegetation in wildland fires. Alternative emission inventories can be constructed based on more detailed emission factors. As a case study, structures constructed before and after 1978 were given different emission factors for Pb, reflecting different estimated loadings of lead paint based on structure age.

## 30. Investigating Surface Air Quality Impacts of the 2025 LA Fires

Brian Schlaff<sup>1</sup>, Sam Silva<sup>1</sup>, Yan Lu<sup>1</sup>, Jiachen Zhang<sup>1</sup>, Karen McKinnon<sup>2</sup>

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The January 2025 LA fires burned over 50,000 acres, destroyed over 18,000 structures, and killed 31 people, marking them as one of the worst natural disasters in California's history. In addition to the visible damage they had wreaked, the fires impacted surface air quality and potentially exposed residents of the LA region to numerous hazardous air pollutants. Given the severity of the fires, it is critical to understand the extent of surface air quality impacts. Here, we investigate the surface air quality impacts of the fires throughout the greater LA region using the satellite-based NOAA Hazard Mapping System (HMS) smoke product and surface PM<sub>2.5</sub> data from the South Coast Air Quality Management District AirNow sensor network and PurpleAir sensor network. We assess statistical significance of PM<sub>2.5</sub> concentrations on days with observed HMS smoke plumes aloft compared to days with no smoke plume using a generalizable non-parametric approach. Additionally, we assess for potential smoke impacted days missed by the HMS smoke product. In both cases we control for false discoveries that stem from multiple hypothesis testing. We estimate that between 7.64 and 7.96 million people were exposed to wildfire smoke from these fires. This work further contributes to literature on how to best make use of near-real time data products for smoke exposure assessment. For the LA fires specifically, our work suggests that combining all of the HMS smoke product data with surface stations can provide additional information on the spatial extent of surface impacts.

### 31. Post-Wildfire Soil Lead Hazards Across Residential Landscapes in Los Angeles County

Nouh Sepulveda<sup>1</sup>, Lexy Flores<sup>1</sup>, Myra Farooq<sup>1</sup>, Sanjay Mohanty<sup>1</sup>

<sup>1</sup> SEA Lab, University of California, Los Angeles

Concern about the effects of fire on wildland-urban interface communities has increased, particularly regarding human health risks associated with lead (Pb) in post-fire soil contamination. This study aims to provide data showing how Pb levels in soils collected from fire-affected areas in Los Angeles County changed following the January 2025 Palisades and Eaton wildfires. The study seeks to establish how property conditions based on fire damage influence observed contamination levels as determined through laboratory soil analysis. GIS tools are used to develop a broader understanding of contamination patterns across impacted regions, limiting the investigation to properties damaged by fire. Soil samples were collected from burned and unburned properties, including parcels where soil had been removed, and were analyzed to determine Pb concentrations. This data was integrated with GIS-based location information to produce maps illustrating Pb patterns across fire-affected areas. Results show a relationship between Pb levels in soil and both the location and post-fire condition of properties. In communities and in areas without soil removal, higher Pb concentrations were observed. Elevated Pb levels were identified in areas beyond those devastated by fire, with many standing homes exhibiting concentrations similar to destroyed parcels. Evidence suggests that Pb patterns reflect both residual wildfire impacts and pre-existing urban development factors. These findings indicate that post-fire Pb contamination extends across residential landscapes and may not be visually apparent. Integrating soil concentration data with geographic context supports the development of informed remediation strategies to protect public health in fire-affected communities.

### 32. Persistence in the Palisades: A Look into the Soil Composition Post-Fire

Natalia Stoa<sup>1</sup>, Zach Jennings<sup>1</sup>, Brenton Spies<sup>1</sup>, Sean Anderson<sup>1</sup>, Timnit Kefela<sup>1</sup>

<sup>1</sup> California State University, Channel Islands

On January 7, 2025, the Palisades fire lit, destroying over 9000 hectares of land and thousands of structures. Many of these structures were residential, displacing thousands of residents, which called for fast clean up. The United States Army Corps of Engineers partook in hazardous waste removal, completed in February 2025, and fire debris removal, completed in July 2025. Despite these efforts, the community filed hundreds of complaints revolving around poor standards of quality and an incomplete job done by the USACE. Reports identified remaining debris, remediation only completed on parts of the property, inadequate soil excavation, and other various shortcomings. Despite this, clearances were given to begin the rebuilding process, with the first certificate of occupancy granted in November 2025. The environmental health conditions after the combustion of anthropogenic materials and the resulting bioavailability via uptake of contaminants remains unclear. Using samples from 4 sites collected from Topanga Canyon, broader Palisades residences, and community spaces 6 months post-fire, we examined soil health recovery from wildfire deposited toxicants. We ran a CAM-17 analysis to measure trace metal concentrations, with focus on findings related to lead and arsenic as well as tests to evaluate the biological, chemical, and physical health of the soil in assessment of the impact relative to each site. We sampled shared community spaces and residential properties within the bounds of the Palisades Fire burn scar. Review of preliminary studies, sentiments from owners' private testing, and early findings suggest the persistence of hazardous materials in the cleared soil.

### 33. Heavy Metals Content in Ash from the 2025 Eaton Fire

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The 2025 Eaton fire (Atladena, CA) was an unusual fire at the Wildland-Urban Interface because >90% of the homes incinerated were built pre-1978. These homes were thus likely to contain significant amounts of hazardous constructions materials like

lead-paint and asbestos, which have since been banned by the Environmental Protection Agency (EPA) for their danger to human health. Real-time measurements of fine aerosol 14 miles south of the fire zone confirm that high amounts of lead (up to 500 ng/m<sup>3</sup>) were released as the fire swept through Altadena. The release of such toxic materials as vapors, fine particles, and ashes raises significant public health concerns. For the Eaton fire, these risks are further heightened by the potential for efficient transport over large distances enabled by the extreme winds that fanned the fire. How much lead and heavy metals were indeed present in the fire zone? How far were they transported by the intense winds? Here, we report on the elemental composition of Eaton fire ash samples and assess the extent of mobilization and transport of the contaminants released by fire. Specifically, we measured by Q-ICPMS the concentrations of major and trace elements in 47 ash samples and 3 soil samples from the Eaton Fire. These samples were collected in the initial 4 weeks after the fire devastated Altadena, in areas ranging from deep within the burn site to neighborhoods miles away. This approach both minimized post-fire modification of the ashes (e.g., by rain) and ensured that variations in the ashes compositions over a broad area, if present, could be documented. At the conference, we will report on the spatial distribution of lead and heavy metals in the ashes from the Eaton Fire, and discuss the implications both from a material transport perspective, as well as a public health and regulatory perspective.

### 34. Temporal Changes in Indoor and Outdoor Particulate Pollution during and after the 2025 Los Angeles Wildfires

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**Background:** Wildfires at the wildland–urban interface (WUI) are an increasing public health threat, yet the temporal dynamics of particle-bound elemental components during and after wildfire events remain poorly characterized. **Hypothesis:** We hypothesized that wildfire emissions would substantially elevate airborne particulate matter and fire-related metal tracer levels. **Methods:** During the January 2025 Los Angeles wildfires, we conducted paired one-week indoor and outdoor air sampling at 22 households across three fire phases: active burning with <50% containment, active burning with >50% containment, and post-fire. We measured fine particulate matter (PM<sub>2.5</sub>), black carbon (BC), and 55 elemental components to characterize changes in exposure and indoor infiltration. **Results:** Outdoor and indoor concentrations of PM<sub>2.5</sub>, BC, and most elemental species peaked during the first week of active burning and declined substantially in later phases. Biomass-burning tracers (e.g., K, P) and toxic metals (e.g., Pb, As, Cd) were orders of magnitude higher outdoors during active burning than post-fire periods. Indoor-to-outdoor (I/O) ratios for most elements were lowest during the first week of active burning; yet indoor concentrations still approached outdoor levels, reflecting the exceptionally high outdoor pollution during this period. The inverse relationship between outdoor elemental concentrations and corresponding I/O ratios illustrates the strong temporal dynamics of wildfire smoke and its contribution to indoor exposure. **Conclusions:** These temporal shifts in indoor and outdoor particulate pollution underscore the need for timely public-health guidance, rapid risk communication, and strengthened indoor protection to reduce exposure during peak wildfire smoke events.

### 35. Findings from Resting Electrocardiogram Screening in Active-Duty Firefighters

Lucas Achkarian<sup>1</sup>, Lelija Kazlauskas<sup>1</sup>, Minhao Wang<sup>1</sup>, Szu Chieh Lee<sup>1</sup>, Eli Friedman<sup>1</sup>, Susan Cheng<sup>1</sup>, Joseph E. Ebinger<sup>1</sup>, Sandy Y. Joung<sup>1</sup>, Alan C. Kwan<sup>1</sup>

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### 36. Assessing Sequelae of Hazardous Exposures on Physical and Mental Health After LA Fires

Christina Batteate<sup>1</sup>, Irish Del Rosario<sup>1</sup>, Joanne Fierro<sup>1</sup>, Yu Yu<sup>1</sup>, Fernando Lezama<sup>1</sup>, Nic Baddour<sup>1</sup>, Kari Nadeau<sup>2</sup>, Mary Johnson<sup>2</sup>, David Eisenman<sup>1,3</sup>, Michael Jerrett<sup>1</sup>, Wendie Robbins<sup>4</sup>, Beate Ritz<sup>1</sup>

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The UCLA Los Angeles Wildfire Exposure Study (LA-WES) aims to understand how toxic substances and socioeconomic disruptions from the Palisades and Eaton wildfires affected people's health and well-being. From March 2025 - September 2025, we recruited participants and collected surveys, spirometry data, and biospecimens (blood and urine). Study participants (n = 104) lived in mandatory or voluntary evacuation areas from the Eaton and Palisades fires (n=98) or were from a small control group recruited from an existing cohort (n=6) that live in LA County but not near the burn zones of the fires. Survey and spirometry data are under analysis at UCLA and blood specimens are being analyzed for inflammatory markers of metals exposure. Funding is needed for additional analyses of urine and blood biomarkers. This feasibility study demonstrated that local institutions with environmental health expertise are key to collecting perishable health data in the time-period immediately following a disaster. Existing cohorts should be leveraged to draw pre-disaster health data, and community groups and health systems are strong partners for reaching prospective study participants.

### 37. Self-Reported Symptoms and Health Outcomes Experienced by Local Residents and Firefighters in Response to the Los Angeles Wildfire Exposures

Preet Desai<sup>1</sup>, Szu Chieh Lee<sup>1</sup>, Minhao Wang<sup>1</sup>, Marilyn Mendez<sup>1</sup>, Alan C. Kwan<sup>1</sup>, Joseph E. Ebinger<sup>1</sup>, Susan Cheng<sup>1</sup>, Sandy Joung<sup>1</sup>

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**Background:** In the wake of the January 2025 Los Angeles fires, first-responder firefighters and local residents experienced a wide range of symptoms and health effects that have yet to be fully characterized. **Methods:** We conducted a standardized comprehensive survey of wildfire related symptoms and health effects experienced among 786 adults, including active-duty firefighters (N=258) and local residents (N=528) of Los Angeles County. **Results:** Cohort characteristics and frequency of overall symptoms reported are shown. Among firefighters, 29 (11.2%) reported new-onset symptoms and 14 (5.4%) reported worsening of pre-existing symptoms. Among civilian residents, 77 (14.6%) reported new-onset symptoms and 62 (11.9%) reported worsening of pre-existing symptoms. The most frequently reported types of new-onset symptoms are shown, along with the most frequently reported types of pre-existing symptoms that worsened after onset of the fires. Approximately half of affected individuals reported symptoms persisting beyond 3 months. However, only a minority sought medical attention for their post-fire symptoms, most of whom did so through urgent care visits. **Conclusion:** Among surveyed first-responder firefighters and local residents, a substantial minority reported new or worsened symptoms following onset of the January 2025 wildfires. Despite many with symptoms that persisted beyond 3 months, most affected individuals did not seek medical attention for these health effects.

### 38. Self-Reported Behavioral Responses of Local Residents to the Los Angeles Wildfire Exposures

Preet Desai<sup>1</sup>, Lelija Kazlauskas<sup>1</sup>, Minhao Wang<sup>1</sup>, Szu Chieh Lee<sup>1</sup>, Marilyn Mendez<sup>1</sup>, Alan C. Kwan<sup>1</sup>, Joseph E. Ebinger<sup>1</sup>, Sandy Joung<sup>1</sup>, Susan Cheng<sup>1</sup>

<sup>1</sup> Cedars-Sinai Medical Center, Los Angeles, California

**Background:** Behavioral responses to the Los Angeles wildfire exposures of January 2025 varied widely among local residents. There is currently limited data on behavioral patterns related to risk mitigation efforts. **Methods:** We conducted a survey of N=528 local residents regarding their behavioral responses following the onset of the Los Angeles wildfire events of January 2025. **Results:** Among the residents surveyed, 98 (18.5%) reported evacuating their homes temporarily, with 8 (8%) relocating two or more times. Of those who evacuated, 45 (46%) returned within a week and 5 (5%) within 1 to 3 months. The remaining evacuees did not report their date or details related to their return. Of all 528 surveyed residents, exposure mitigation strategies were used by 347 (66%) residents, with 158 (45%) using these strategies daily and 88 (25%) using them occasionally (1-2 days/week). A total of 311 (90%) of residents reported mask use, 24 (6.9%) reported personal protective equipment use, 172 (50%) residents reported air filter or air circulator use, and 70 (20%) reported the use of a water filter or new water source. **Conclusion:** Behavioral responses among local residents varied in response to the Los Angeles wildfires. Overall use of accessible exposure mitigation strategies was high for masking but lower for use of other generally accessible strategies, including use of air filtration devices. These findings provide preliminary quantitative insight into risk mitigation behaviors during wildfire events, allowing for improved public health planning for future exposures.

### 39. Changes in Serum Proteins in Firefighters Responding to the 2025 Los Angeles Urban Conflagrations

Melissa Furlong<sup>1</sup>, Shawn C. Beitel<sup>1</sup>, Reagan Conner<sup>1</sup>, Jaclyn M. Goodrich<sup>2</sup>, Xinxin Ding<sup>3</sup>, Matt Rahn<sup>4</sup>, Kelcey Stricker<sup>4</sup>, Aaron Guggenheim<sup>5</sup>, Alexander Hamilton<sup>6</sup>, Derek Biering<sup>7</sup>, Jeff Hughes<sup>8</sup>, John J. Gulotta<sup>9</sup>, Cynthia Porter<sup>1</sup>, James Hollister<sup>1</sup>, Jeff L. Burgess<sup>1</sup>

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<sup>8</sup> Orange County Professional Firefighters

<sup>9</sup> Tucson Fire Department

**Background:** Firefighters are asking for information on the health risks of responding to the January 2025 LA area urban conflagrations. Serum proteins are important predictors of future diseases, and wildland firefighters have increased serum inflammatory markers following exposure. The purpose of this study was to evaluate protein changes in serum collected from firefighters before and after the urban conflagrations. **Hypothesis:** The serum proteome of firefighters will change following their response to the LA urban conflagrations, particularly in proteins associated with inflammatory response. **Methods:** Over 10,000 proteins were evaluated in 42 Los Angeles area firefighters enrolled in the Fire Fighter Cancer Cohort Study (FFCCS) with blood specimens collected in 2024 and in January and February of 2025, an average of 8.6 days after their most recent response to the urban conflagrations. **Results:** Sixty proteins changed significantly from before to after exposure. These proteins were associated with nucleotide synthesis and repair, oxidative stress response, energy metabolism, and other mechanisms. Pathway analysis identified changes in metabolism and oxidative stress, immune and inflammatory responses, cellular barrier integrity and trafficking, and growth/cancer signaling. **Conclusion:** Response to the Los Angeles area urban conflagration was associated with a change in the serum proteome of firefighters, which may reflect increased risk of long-term adverse effects.

## 40. Montreal Cognitive Assessment (MoCA) Neurocognitive Assessment Findings in Active-Duty Firefighters

Patrick Herbig<sup>1</sup>, Briana Khuu<sup>1</sup>, Wasay Warsi<sup>1</sup>, Tzu Yu Huang<sup>1</sup>, Clarissa Lee<sup>1</sup>, Preet Desai<sup>1</sup>, Jeffrey Wertheimer<sup>1</sup>, Mitzi Gonzales<sup>1</sup>, Susan Cheng<sup>1</sup>, Zaldy Tan<sup>1</sup>, Sandy Y. Joung<sup>1</sup>

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## 41. Exposure to Smoke Is Associated with Increases in Inflammatory Biomarkers, Chemotaxis and Immune Signaling Pathways

Mary Johnson<sup>1</sup>, Sandy Y. Joung<sup>2</sup>, Youn Soo Jung<sup>1</sup>, Abhinav Kaushik<sup>1</sup>, Colin Skeen<sup>1</sup>, Sandy Y. Joung<sup>2</sup>, Briana Khuu<sup>2</sup>, Christina Tong<sup>2</sup>, Kari Nadeau<sup>1</sup>, Susan Cheng<sup>1</sup>

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**Background:** Acute smoke exposure is associated with respiratory, cardiovascular, neurological and immunological outcomes. To further investigate the health impacts from smoke exposure, blood was collected before and after the fires in subjects living both close to and far away from the January 2025 Los Angeles fires. **Hypothesis:** Acute smoke exposure is associated with within-subject increases in inflammatory cytokines and chemokines for those close to the fires versus those living further from the smoke will not have significant increases. **Methods:** After IRB consent, blood was collected from n=86 participants living close to the fires (Mean distance = 7.6 miles) and n=86 participants living further from the fires (Mean distance = 47.9 miles) both at baseline (prior to the January 2025 LA fires) and after wildfire smoke exposure (average time between blood draws was 228 days). A 250-plex Nucleic acid Linked Immuno-Sandwich Assay (NULISA™) assay containing cytokines and chemokines and other proteins was performed on the plasma samples. **Results:** Principal Component Analysis found sex, race and distance to the fire to be significant covariates. A linear mixed effect model for paired analysis found that 33 biomarkers (63.5%) significantly changed from baseline to after smoke exposure (e.g. increases in IL-9, CCL17 and CTF1 post wildfire). Functional enrichment of these biomarkers found that they are associated with various processes such as neutrophil chemotaxis, granulocyte migration and chemokine-mediated signaling pathways. **Conclusion:** Exposure to the smoke was associated with changes in biomarkers related to functional immune impairment at the cellular level.

## 42. Wildfire Smoke and Plasma Metabolomic Signatures in Los Angeles-Area Residents

Youn Soo Jung<sup>1</sup>, Colin Skeen<sup>1</sup>, Mary Johnson<sup>1</sup>, Parham Azimi<sup>1</sup>, Zidong Song<sup>1</sup>, Peng Gao<sup>1</sup>, Joseph Allen<sup>1</sup>, Kari Nadeau<sup>1</sup>

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**Background:** Wildfire (WF) smoke contains a complex mixture of particles and gases that may alter human metabolism, yet metabolomic signatures of WF exposure in community settings are not well characterized. This study evaluated plasma metabolites in relation to time since WF smoke exposure in Los Angeles-area homes enrolled in the 50 Homes Study. **Hypothesis:** We hypothesized that high-resolution metabolomics would identify endogenous and xenobiotic metabolites whose plasma levels are associated with time since WF smoke exposure. **Methods:** Untargeted LC-MS plasma metabolomics was performed in 37 participants (25 households), yielding 471 positive ion and 336 negative ion features. After quality control for missingness and overlapping features, 171 unique metabolites were kept. Temporal association between metabolite intensities and post-WF exposure was modeled as a function of age, months since fire, return to home status, and household membership. UMAP was used for dimensionality reduction, and metabolite clusters were tested for class enrichment using chi-square tests. **Results:** Acetyl-L-carnitine showed a temporal association with WF post-exposure, increasing by 0.35 log units per month (27% per month, FDR = 0.003). UMAP identified five clusters with non-random distributions of metabolite classes (chi-square p = 0.003), including xenobiotic-enriched clusters and clusters dominated by endogenous lipids, amino acids, and phospholipids. **Conclusion:** This preliminary analysis shows that high-resolution metabolomics may distinguish endogenous metabolic pathways from xenobiotic-rich domains after WF exposure and suggests that exogenous chemicals contribute to the post-fire metabolic profile. Future work will incorporate individual-level WF exposure metrics, perform pathway enrichment on

exposure-responsive metabolites, and assess whether xenobiotic-enriched clusters drive exposure-related metabolic signatures.

#### 43. Domain-Specific Neurocognitive and Neuroaffective Alterations in Active-Duty Firefighters

Briana Khuu<sup>1</sup>, Wasay Warsi<sup>1</sup>, Tzu Yu Huang<sup>1</sup>, Clarissa Lee<sup>1</sup>, Patrick Herbig<sup>1</sup>, Preet Desai<sup>1</sup>, Jeffrey Wertheimer<sup>1</sup>, Mitzi Gonzales<sup>1</sup>, Susan Cheng<sup>1</sup>, Zaldy Tan<sup>1</sup>, Sandy Y. Joung<sup>1</sup>

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#### 44. Wildfire Smoke-Related PM2.5 Concentration Measurements, Perceived Indoor Air Quality, and Health Symptoms among Southern California Residents during the 2025 Los Angeles Wildfires: A Latent Class Mediation Approach

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**Background:** Numerous studies have linked wildfire exposure to adverse physical and mental health outcomes and symptoms. However, few studies incorporate both outdoor wildfire smoke-related PM2.5 concentration and indoor air quality measurements. Understanding the mechanisms by which objectively measured and perceived wildfire smoke impact people's health could facilitate interventions to mitigate adverse health effects. **Hypothesis:** We hypothesized that higher wildfire smoke-related PM2.5 concentration would be associated with greater likelihood of belonging to symptomatic classes, and that perceived indoor air quality would partially mediate this relationship. **Methods:** Survey data were obtained from 893 adult residents in the Los Angeles area 2-3 months after the 2025 wildfires. A latent class analysis identified subgroups of people with similar symptom experiences. Associations between wildfire smoke-related PM2.5 concentration and perceived indoor air quality with likely class membership were examined. **Results:** We identified three latent subgroups: Physical and Mental Health Symptoms, Physical Health Symptoms, and No Symptoms. Higher outdoor wildfire smoke-related PM2.5 levels were associated with a higher likelihood of belonging to the symptomatic classes, and perceived indoor air quality statistically explained most of this association. **Conclusion:** Indoor exposure may be an important mechanism by which people are exposed to wildfire smoke, which can cause adverse health symptoms. While outdoor PM2.5 concentration is commonly used in wildfire exposure research, our findings suggest that perceived indoor air quality provides additional explanatory information about who experiences more severe symptom profiles, particularly for Wildland-Urban Interface fires where many residents are sheltering in place.

#### 45. Assessment of Liver Alterations in Active-Duty Firefighters

Szu Chieh Lee<sup>1</sup>, Minhao Wang<sup>1</sup>, Andrew Nguyen<sup>1</sup>, Breanna Sung<sup>1</sup>, Kenia Gastelum<sup>1</sup>, Vanessa Solomon<sup>1</sup>, Aarshi Vipani<sup>1</sup>, Amanda Velazquez<sup>1</sup>, Susan Cheng<sup>1</sup>, Sandy Y. Joung<sup>1</sup>

<sup>1</sup> Cedars-Sinai Medical Center, Los Angeles, California

#### 46. Evaluation of Sleep Quality in Active-Duty Firefighters

Clarissa Lee<sup>1</sup>, Wasay Warsi<sup>1</sup>, Tzu Yu Huang<sup>1</sup>, Briana Khuu<sup>1</sup>, Preet Desai<sup>1</sup>, Patrick Herbig<sup>1</sup>, Grace M. Juarez<sup>1</sup>, Jeffrey Wertheimer<sup>1</sup>, Mitzi Gonzales<sup>1</sup>, Susan Cheng<sup>1</sup>, Zaldy Tan<sup>1</sup>, Sandy Y. Joung<sup>1</sup>

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## 47. Impact of the Wildfires on Physical Activity, Sleep, and Physiological Stress of Older Adults: A Cohort Study During 2025 Eaton Fire in Los Angeles

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**Background:** The Eaton Fire broke out in Los Angeles County on January 7th, 2025, triggered widespread evacuations.

**Hypothesis:** We hypothesized that wildfire and associated evacuations will have an adverse impact on activity patterns, disrupt sleep, and impose physiological stress. **Methods:** This cohort study included 15 older adults [age mean (range): 73.2 (67 – 82) years, eight males and seven females] in Los Angeles County from December 2024 – Jan 2025. Participants wore the Oura Ring Gen 3 continuously at baseline (Dec 9th- 2024 to Jan 6th, 2025) before the fire, as well as during (Jan 7th, 2025 – Jan 12th, 2025) and after (Jan 13th – Jan 27th, 2025) the fire. Daily measurements were remotely collected for physical activity (daily steps, activity, and sedentary time), sleep (sleep duration and sleep-wake transitions) and heart rate (HR) through the Oura Ring. Paired t-tests were conducted to assess changes in these biosignals during and after the fire vs baseline. Linear mixed-effects models were used to determine how evacuation alerts impacted these biosignals during and after fire. **Results:** Among the fifteen participants, all living within 10 miles of the Eaton fire, and eight received evacuation alerts. During the fire, we found a significant increase in sedentary time (49.9 minutes/day; P=0.03), a reduction in high-intensity activity (-33 minutes/day; P=0.021), and a decrease in total sleep duration (-33 min/night; P=0.043). After the fire, physical activity reduction persisted, including step count (-731 steps/day; P=0.017) and low-intensity activity (-22.4 minutes/day; P=0.028). Among participants who received evacuation alerts, sleep HR increased by 2.3 bpm (P=0.018) and 2.2 bpm (P=0.001) during and after the fire compared to baseline, and sleep-wake transitions increased by 0.8 events/nights (P=0.03) after the fire. **Conclusion:** This study found that wildfires adversely impact physical activity, sleep, and physiological stress among older adults.

## 48. Body Fat and Muscle Composition Analyses in Firefighter and Civilian Cohorts

Andrew Nguyen<sup>1</sup>, Minhao Wang<sup>1</sup>, Szu Chieh Lee<sup>1</sup>, Amanda Velazquez<sup>1</sup>, Susan Cheng<sup>1</sup>, Sandy Y. Joung<sup>1</sup>, Alan C. Kwan<sup>1</sup>

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## 49. No Shelter from the Storm: Wildfires, Winds and Homelessness in Los Angeles

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The impact of the devastating January 2025 Los Angeles (LA) County firestorm on people experiencing homelessness (PEH), a population typically overlooked during natural disasters, remains unknown. The objective of this study was to determine the degree of firestorm exposure and associations between firestorm exposure and the short-term health and social impacts of the firestorm on PEH in LA County. We analyzed data from the Periodic Assessment of Trajectories of Housing, Homelessness, and Health (PATHS), an ongoing longitudinal monthly panel survey of roughly 500 PEH in LA County. We administered survey questions on firestorm exposure two weeks after the firestorm began. We linked available patient location data with wind speed and air quality data. We conducted descriptive analyses, examined the relationship between self-reported and remotely-sensed measures of wildfire and extreme wind exposure, and performed difference-in-differences analyses using mixed-effects logistic regression models to determine associations between firestorm exposure variables and self-reported health, controlling for sociodemographic variables. Of the 534 active PATHS participants, 403 were included in the primary analytic sample. 76% of

survey participants reported disruption from the firestorm, with higher rates among those unsheltered versus sheltered. Generally, self-reported disruption and remotely sensed air quality and wind speed data did not directly align. Difference-in-differences analyses did not identify statistically significant associations between extreme wind- and wildfire-related disruption and subsequent outcomes. Our findings suggest that unsheltered PEH were especially vulnerable to the firestorm but that the firestorm did not significantly affect longitudinal measurements of self-reported health, which were already poor at baseline.

## 50. Multidimensional Exposure Pathways and the Mental Health Burden of the January 2025 Los Angeles Wildfires

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The January 2025 LA Fires exposed Los Angeles County residents to immediate threats to their physical safety and toxic air pollution as the fires burned through vegetated and urban areas. Prior research on wildfires consistently shows elevated risks for anxiety, depression, and post-traumatic stress, underscoring the need to understand how these events, particularly those that occur in the wildland-urban interface, affect mental health in exposed communities. To advance this literature, we commended a transdisciplinary project to examine how LA Fires shaped residents' mental health through multiple exposure pathways. First, our team is mapping daily physical exposure patterns across LA County based on active burning zones, physical infrastructure damage, and smoke-contributed air pollution using satellite remote sensing and atmospheric modeling. In parallel, we are assessing mental health outcomes (depression, anxiety, and fire-related post-traumatic stress) throughout LA County, by administering survey studies to a representative YouGov sample and participants from the UCLA Health Wildfire Research Registry. These two data sources will then be merged, with exposure metrics spatially assigned to survey respondents based on geocoded addresses. These data will be analyzed to clarify the mental health burden of the fires by detecting the effects of exposures on mental health outcomes, expanding post-fire mental health screening, and identifying high-risk groups for early intervention.

## 51. Point-of-Care Ultrasound Assessment of Subclinical Cardiac Alterations in Active-Duty Firefighters

Breanna Sung<sup>1</sup>, Szu Chieh Lee<sup>1</sup>, Minhao Wang<sup>1</sup>, Marilyn Mendez<sup>1</sup>, Eli Friedman<sup>1</sup>, Alexander Kukuev<sup>1</sup>, Joseph E. Ebinger<sup>1</sup>, Susan Cheng<sup>1</sup>, Sandy Y. Joung<sup>1</sup>, Alan C. Kwan<sup>1</sup>

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## 52. Assessment of Excess Mortality from Acute Wildfire Smoke Exposure During the 2025 Los Angeles Fires

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In January 2025, a series of wildfires burned over 50,000 acres in Los Angeles County and destroyed over 16,000 structures. While official reports mention 30 direct fatalities, this figure does not adequately represent the true mortality burden of these fires. Air pollution from wildfire smoke contributed to unhealthy levels of hazardous pollutants, such as fine particulate matter (PM<sub>2.5</sub>), which cause increased cardiovascular and respiratory mortality, yet this smoke-specific mortality is typically overlooked when assessing wildfire damage and losses. We hypothesize that even short periods of acute wildfire smoke exposure resulted in a significant increase of same-day all-cause mortality in Los Angeles County. Leveraging high-resolution air quality forecasts from BlueSky/HYSPLIT simulations, we quantify the daily excess mortality due to wildfire-specific PM<sub>2.5</sub> exposure during the 2025 wildfire episode in Los Angeles County. We employ a log-linear risk model with a pooled risk value for acute wildfire smoke exposure along with census tract level population data to best approximate the true exposure scenario. Analyzing the high-resolution air quality data allows to identify census tracts most impacted by unhealthy air quality, which are

predominantly found in the southern part of the county. These pollution levels result in an estimated total of 14 unaccounted (same-day) excess deaths (county-wide) during the fire episode. Including lagged effects results in a fourfold mortality increase. Our study shows that acute wildfire smoke exposure causes increased mortality, and highlights the potential for real-time wildfire smoke forecasts to enhance healthcare surge planning and emergency response preparedness.

### 53. The Impact of Firefighters' Occupational Exposures on DNA Repair Capacity

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Firefighting involves strenuous physical activity and exposure to harmful emissions from fires. Several studies have linked this exposure to significant changes in biomarkers related to inflammation, vascular damage, and tissue injury among firefighters. There is also an elevated risk of cancer among firefighters, potentially attributed to their exposure to carcinogens during fire combat missions. However, it remains unclear whether certain firefighters are more susceptible to these risks than others, and if so, what steps can be taken to minimize risk. Exposure to carcinogens can lead to genomic instability by directly damaging DNA or impairing DNA repair mechanisms. This can result in the clonal selective expansion of cells with unrepaired DNA damage, contributing to the development of cancer. We hypothesized that DNA damage and repair responses might play a crucial role in the increased cancer risk observed in firefighters. To test our hypothesis, we propose a series of biological tests to evaluate genome integrity using blood samples collected from firefighters. Our study design included assessing the immediate effects of live fire simulator training on new recruits (n=15) at three time points (pre- and post-training, and washout). Additionally, we compare these findings with veteran firefighters who have accumulated extensive years of service to investigate long-term effects of exposures. We quantified DNA damage and the firefighter's DNA repair capacity (DRC) using high throughput assays including CometChip, telomere length analysis, and fluorescence multiplex host cell reactivation. Our results indicated varying response among new recruits at individual level following exposure, although the overall DRC did not show significant changes. We observed a significant reduction in repair activity of hypoxanthine based adduct and oxidative lesion (A:8oxoG) in post-training samples from veteran firefighters. Telomere length did not differ significantly between pre- and post- exposure PBMC samples. This comprehensive examination of genomic integrity, when coupled with other multi-omics analyses, will aid in pinpointing potential DNA repair biomarkers that could provide deeper insights into occupational health risks faced by firefighters and their correlation with heightened cancer risk. These pilot findings will inform larger-scale studies and aid in development of more effective cancer surveillance programs for firefighters, enabling early identification of individuals at higher risk and strategies for risk reduction.

### 54. Neurobehavioral Assessment Findings in Active-Duty Firefighters

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### 55. Impact of 2025 LA Fire on Pregnancy Health Care Utilization

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**Background:** Poor air quality affects pregnancy and health outcomes; however, little is known about the impact of the catastrophic 2025 LA fire on pregnancy and newborns. **Hypothesis:** LA fire is associated with increased health care utilization and adverse health outcomes of pregnancy. **Methods:** A pilot study was conducted to assess the LA fire on pregnancy health care utilization using pregnancy cohort from Kaiser Permanente Southern California (KPSC) with data extracted from electronic

medical records. The smoke exposure was estimated using emissions inventories based on satellite observations of fire progression combined with chemical transport models that track airborne pollutant concentrations over the entire Southern California region for January 2025. The exposure and women's pregnancy addresses were linked using geocodes accounting for address changes. **Results:** PM levels from biomass combustion were notably and significantly higher between 1/8-1/12, thus, the average of the biomass exposures from these 5 days and health care utilization from 1/8-1/14 (7 days) were used as the outcomes in this first analysis. A total of 19,010 pregnant women delivered between 1/13-6/30/2025 at KPSC were used for analysis: median (25th, 75th quartile) age 32.5 (28.7, 35.8) years; 56.2% Hispanic, 20.6% white, 13.1% Asian, 6.1% black. Preliminary analysis showed inverse U shape associations between PM levels from biomass combustion in the 5 days and health care utilization in the 7 days after the fire onset. **Conclusion:** This first pilot data analysis set the premise for subsequent work. More work needs to be done to understand the exposure and impact on health.

## 56. Assessing Trauma, Mental Health, and Substance Use Impacts on HIV Risk-Taking Behaviors among Individuals Living with and without HIV in the Aftermath of the 2025 Los Angeles Fires

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**Background:** The January 2025 fires inflicted devastating impacts on Los Angeles, home to one of the largest and most diverse populations of MSM in the U.S. Major stressors such as wildfires are linked to trauma, mental health concerns, and maladaptive coping (e.g., substance use)—all of which can increase HIV acquisition/transmission. **Hypothesis:** Compared to pre-January 2025, participants will report: 1) greater disruptions to HIV testing, prevention, and treatment; 2) increased HIV-risk sexual behaviors (e.g., condomless sex, more partners); and 3) higher prevalence/severity of psychosocial problems (trauma, depression, anxiety, substance use). **Methods:** This mixed-methods study, funded by the UCLA-CDU CFAR (P30 AI152501), will enroll 200 MSM (ages 18+ years, with/without HIV) who resided in mandatory evacuation zones (Eaton/Palisades/Sunset) during the January 2025 fires. Participants will complete a quantitative survey on sociodemographics, fire-related experiences, and pre/post-fire changes in PrEP/DoxyPEP/ART use, HIV care visits, psychosocial health (depression, anxiety, PTSD, substance use), social support, sexual behaviors, and physical health. To fully understanding their lived experiences, 30-40 participants will complete semi-structured interviews. Survey data will be summarized descriptively, with tests of associations between key variables using parametric/non-parametric tests. Interviews will be transcribed verbatim/analyzed in Dedoose (V10.0.35) using combined deductive/inductive coding. **Results:** Recruitment will commence January 2026 using our participant database, social media, and flyers at gay bars/clubs, HIV/STI clinics, and LGBTQ+-affirming spaces close to the evacuations zones. **Conclusion:** Understanding how natural disasters threaten the continuity of the HIV-care continuum and identifying vulnerabilities/resiliencies may inform disaster-responsive HIV prevention and strengthen services in fire-prone regions.

## Fire and Ecosystems Research – West Coast

### 57. AVIRIS-3 Rapid Response to January 2025 Los Angeles Wildfires

Red Willow Coleman<sup>1</sup>, Megan Ward-Baranyay<sup>2</sup>, Mark Wronkiewicz<sup>3</sup>, Francisco Ochoa<sup>3</sup>, Philip Brodrick<sup>3</sup>

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### 58. Post-wildfire Replanting Decisions as Critical Juncture for Long-Term Landscape Resilience

Kristiann Gomez<sup>1</sup>, Hayden Fausset<sup>1</sup>

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Native plants play an essential role in Southern California ecosystems by supporting biodiversity, improving fire resilience, and reducing water usage. Large swaths of these vegetative communities were decimated by the January 2025 Eaton (5,674 ha; 14,021 ac) and Palisades (9,489 ha; 23,448 ac) wildfires. One year post-fire, recovery is only beginning. Over 2600 rebuild applications have been received, and of those applications, only 36% of destroyed homes in both Altadena and Palisades have been issued building permits. This totals to only 937 Los Angeles County permits as of December 3, 2025 according to LA County Recovers. This rebuilding period marks a critical moment in which homeowners are beginning to make consequential landscaping and reconstruction decisions that will shape these residential communities for decades. Hungry for site-relevant data and recommendations, residents are often left frustrated and confused with no specific guidance. This leaves them at the whim of the exotic, ornamental horticulture industry. Providing a free replanting guide can increase awareness of appropriate native species, while also providing retail options for acquiring seeds and plants within the local community. Early survey efforts from late summer to early winter of 2025 show that 53% of early post-fire regrowth and volunteer species are already native. Combining this with regional nursery inventory data for native plant species allows us to make neighborhood-scale recommendations for species that are both ecologically resilient, and readily obtainable for homeowners.

### 59. The Role of Native Plants in Fire Ecology, Fire-Resistant Landscaping: Synthesized Research

Maryum Merchant<sup>1</sup>, Mufaddal Mamujee<sup>1</sup>

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**Background:** Wildfires spread predominantly by consuming combustible fuel (vegetation) and via windblown embers. Protecting homes and infrastructure relies on reducing available fuel and interrupting the fire's path. **Hypothesis:** Strategic planting of certain native plant species and maintaining adequate defensible space can create natural firebreaks, slowing fire spread and reducing structural ignition risk. **Method:** Review of expert articles to help identify plant characteristics and the spatial arrangement of plants to mitigate fire risk around homes and communities. **Results:** Certain plant characteristics, such as high moisture content, low sap/resin content, an open growth structure, and little dead material, can help slow fire. It also highlights creating three key defensible space zones: Zone 0 (0-5 ft) using non-combustible materials, Zone 1 (5-30ft) using low flammable plants, and Zone 2 (30-100ft), reducing fuel density and vertical continuity by creating greater spacing between well-maintained shrubs and trees. **Conclusion:** The strategic planting and maintenance of fire-resistant native plant species can create natural firebreaks by interrupting the fuel chain, reducing fire intensity, and providing a buffer against ember attack, thereby significantly enhancing the protection of structures and infrastructure from wildfire.

### 60. Small Fish, Big Stakes: Protecting Tidewater Gobies in Times of Disaster

Alexa Murillo<sup>1</sup>, Judyann Bibian<sup>1</sup>, Yaiza Delgado<sup>1</sup>

<sup>1</sup> California State University, Channel Islands

## 61. Fire Damage Assessment from NASA ECOSTRESS

Justin Reinman<sup>1</sup>, Joshua Fisher<sup>2</sup>

<sup>1</sup> Palisades Charter High School

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Geographic imaging data is a powerful tool for understanding how wildfires affect both ecosystems and communities. In this project, we combined ECOSTRESS Evapotranspiration Stress Index (ESI) data with structural fire damage records to analyze environmental stress and residential fire impacts from the Palisades Fire. ECOSTRESS ESI scenes collected before, during, and after the fire were processed in a GIS environment, where raster layers were aligned and visualized to map temporal changes in ESI across the fire footprint. Housing locations and post-fire damage classifications were obtained from official fire-inspection datasets and integrated into GIS as point layers. Boxplots and other visualizations were generated to summarize ESI distributions across areas with varying levels of structural damage, illustrating how environmental stress patterns intersected with impacted neighborhoods. GIS tools facilitated aggregation of ESI values at the parcel and neighborhood scale, making it possible to explore spatial trends in stress across the built environment and to compare these trends with observed damage outcomes. The study highlights the potential of combining ECOSTRESS ESI with GIS and housing-damage data for post-fire analysis. By integrating satellite-derived environmental stress indicators with structure-level spatial information, this work demonstrates a scalable approach for assessing fire impacts on residential areas and provides insight into how landscape-scale moisture stress corresponds with observed patterns of structural damage.

## 62. Empirical Burn Severity Modeling of the 2025 Los Angeles Wildfires Informed by Joint ECOSTRESS and EMIT Fuels Characterization

Megan Ward-Baranyay<sup>1</sup>, Christine M. Lee<sup>1</sup>, Madeleine Pascolini-Campbell<sup>1</sup>, Daniel Sousa<sup>2</sup>, Alicia M. Kinoshita<sup>2</sup>

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## Disaster Response and Recovery Research – West Coast

### 63. Rhetorics of Disaster: Contrasting Social Defense and Security Narratives in Post-Wildfire Altadena and Pacific Palisades

Sean Anderson<sup>1</sup>, Timnit Kefela<sup>1</sup>, Brenton Spies<sup>1</sup>

<sup>1</sup> California State University, Channel Islands

We quantitatively explored divergent rhetorical landscapes of public signage six months after the destructive 2025 LA Wildfires, hypothesizing that recovery narratives within the Altadena (Eaton Fire) and Pacific Palisades/Malibu/Topanga (Palisades Fire) fire scars were distinct. Aggregate sentiments differed significantly ( $\chi^2 = 11.07$ ,  $p = 0.004$ ) between regions (21% negative, 7% neutral, and 72% positive in the Eaton Fire footprint vs. 36% negative, 10% neutral, and 53% positive in the Palisades Fire footprint). Altadena signage generally expressed strong social and economic defense. The core sentiment was marked by pervasive anti-gentrification concerns (“Altadena Not For Sale”, “Black Homes Matter,” etc.) and explicit warnings against exploitation and scams. While Altadena residents occasionally directed criticism toward authority, they strongly prioritized communal integrity and collective political grievance. Conversely, Palisades regional rhetoric centered on physical control and regulated rebuilding. Exclusion and security were paramount, evidenced by the high frequency of trespass warnings and “stay away” signage (21% vs. 8% of Altadena signs). While “For Sale” advertisements and notes on active construction and rebuilding were prevalent, the Palisades emphasis was markedly shifted toward securing property boundaries and managing rapid physical site recovery. Overtly pro-community sentiments were twice as prominent in Altadena (39%) relative to Palisades (19%). These contrasts demonstrate how post-disaster public discourse can be shaped by divergent socio-economic dynamics and perceived threats specific to each impacted community. Understanding these rhetorical landscapes can facilitate better communication and more effective engagement with our local communities as we seek to recover and rebuild post-wildfire.

### 64. Leveraging Medical Sustainability for Disaster Response: The Medical Aid Initiative at UCLA's Role in Supporting Communities Impacted by the Los Angeles Fires

Hanna Boughanem<sup>1</sup>, Sree Nagaraj<sup>1</sup>, Rhea McKenzie<sup>1</sup>, Abigail Chang<sup>1</sup>, Seena Amin-Sanayei<sup>1</sup>, Avantika Aggarwal<sup>1</sup>, Emmet Asker Amaan Bapoo<sup>1</sup>, Ellie Tsao<sup>1</sup>, Lota Uyanwune<sup>1</sup>, Gia Patel<sup>1</sup>, Ava Tam<sup>1</sup>

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The 2025 Los Angeles fires exposed a predictable but preventable gap in emergency resource distribution. Wildfires now account for over 30% of California's PM2.5 burden, worsening respiratory morbidity and straining public health systems. The 2025 Los Angeles fires intensified this burden, especially for displaced residents requiring immediate medical and hygiene supplies. The Medical Aid Initiative (MAI), an undergraduate-led medical sustainability program at UCLA, helped meet this need by redirecting unused medical supplies—materials that would otherwise contribute to California's over 700 million pounds of annual healthcare waste—toward fire-affected communities. MAI's three-pillar model (Sustainability, Distribution, Awareness) enabled rapid mobilization. In partnership with UCLA College Corps, MAI provided hundreds of pounds of gloves, masks, wound-care items, and sanitation supplies drawn from our warehouse inventory for care packages distributed to evacuees across Los Angeles County. These efforts simultaneously reduced incineration-driven emissions—an often overlooked contributor to poor air quality during wildfire events—and demonstrated the feasibility of integrating medical waste-reduction strategies into regional disaster-response pipelines. Since 2018, MAI has diverted over 7,000 pounds of supplies from landfills and saved more than \$400,000 in medical resources globally. Our response during the fires provides a practical model for how local sustainability initiatives can inform broader research and policy discussions on disaster resilience in high-risk regions. As wildfires become more frequent and more damaging, building these systems proactively will determine whether communities receive timely, appropriate care when it matters most. This work serves as a case study in how sustainability-driven redistribution models can operate as evidence-based, scalable interventions that support both ecological health and emergency relief in an era of increasingly severe wildfires. It may also be used to inform cross-sector research on disaster preparedness in high-risk regions like Los Angeles.

## 65. Wildfire Risk Perception and Responses: Policy Analysis and Survey Design

Sizhuo Chen<sup>1</sup>, Zhen Cong<sup>1</sup>

<sup>1</sup> Chapman University

This presentation draws on my previous dissertation research exploring the interaction between wildfire risk, housing market dynamics, and suburban residential land development. Using transaction data from Southern California, I examined how wildfire hazard zoning and public disclosure influence housing market behavior. Although no significant price effects were detected for homes within the Very High Fire Hazard Severity Zone, a small decline in the probability of home sales following disclosure suggests meaningful behavioral responses beyond pricing. Additionally, my research analyzed how housing density affects human-caused wildfire ignitions across ten western U.S. states, finding ignition risk increases in a concave pattern with density, especially in low-precipitation, complex land-use, and high-demand suburban areas near metropolitan fringes. These findings highlight that wildfire risk disclosure impacts market activity primarily by altering liquidity rather than prices and that suburban development patterns contribute to ignition risk. Building on this foundation, we are currently developing a survey aimed at investigating behavioral responses to wildfire risk information and adaptation practices among residents that experienced wildfires. This upcoming research seeks to deepen understanding of risk perception and decision-making processes that can inform more effective wildfire risk management and policy interventions.

## 66. Fast, Fair, and Focused: A Hybrid Framework for Rapid Post-Wildfire Community Needs Assessment in Los Angeles County

Adrienne Martinez-Hollingsworth<sup>1</sup>, Jeremiah Garza<sup>2</sup>, Zurisdai Inzunza<sup>1</sup>

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**Background:** Balancing rapid data needs with rigorous, inclusive methods is essential to post-wildfire assessment and understanding how best to support affected communities. Following the January 2025 wildfires, the LA County Department of Public Health, AltaMed Health Services, and others developed a conceptual framework guiding assessments aimed at learning how to most effectively help residents immediately and optimally meet their health and social service needs. The framework addresses tension between urgent data demands and slower, community-driven sampling, emphasizing that meaningful recovery work begins before surveys launch and must consider methodological limits, participant safety, underlying assumptions, and decisions any resulting data will guide. It incorporates a multi-pronged strategy that leverages existing resources, accelerates rapid, broad outreach, and ensures inclusive community input. **Hypothesis:** A deliberately conceptualized hybrid model balancing rigor with speed, reach, and community trust can generate actionable early insights to meet immediate health and social service needs while preserving long-term data integrity and supporting equitable recovery. **Methods:** Two pathways were evaluated: a rapid-reach model prioritizing immediacy and board coverage, and a structured model focused on precision and longitudinal value. Collaborative virtual design sessions clarified trade-offs, ethical considerations, and analytic implications, informing a phased strategy using existing resources, wide-net early outreach with optional identifiers, mixed-mode recruitment, and targeted follow-up. **Results:** Conceptual modeling demonstrated early decisions around accessibility, anonymity, rigor, and community engagement shape downstream data quality and capacity to respond effectively to community needs. **Conclusion:** Intentional conceptual design enables assessments that are both immediately actionable and supportive of comprehensive, equitable long-term recovery.

## 67. Evacuation and Transportation Barriers Among Vulnerable Populations in Natural Hazard-Related Disasters: A Scoping Review

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Natural hazard-related disasters such as wildfires, hurricanes, earthquakes, and floods pose significant risks to older adults, individuals with disabilities, and those with chronic health conditions. Transportation-related challenges during and after evacuation can severely impact their safety, mobility, and recovery. This scoping review examines the current evidence to identify research gaps and inform strategies to improve evacuation outcomes and long-term resilience for these at-risk groups. This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews guidelines and searched five databases—PubMed, APA PsycINFO, CINAHL Complete, EMBASE, and Web of Science—for primary studies on transportation and disaster evacuation among vulnerable populations. The STEPS framework (Spatial, Temporal, Economic, Physiological, Social) was applied to guide the analysis and interpretation of findings. Twenty studies were included. Four key areas of concern were (1) immediate transportation barriers during evacuation, (2) prolonged transportation disruptions post-disaster, (3) anticipated logistical challenges in future evacuation planning, and (4) inconsistent and inaccessible communication of transportation-related information during emergencies. These challenges intersected with all five STEPS dimensions. Transportation barriers remain a persistent and under-addressed risk factor in disaster contexts for vulnerable groups. The STEPS framework helped reveal the multidimensional nature of these issues, emphasizing the need for integrated planning, assistive transport options, inclusive communication systems, and stronger public–private coordination. Future research should focus on collecting disaggregated data, evaluating interventions, and supporting inclusive policy reforms tailored to each type of disaster.

## 68. Post LA Fires Cleanup – The Role of Day Laborers and Domestic Workers

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**Background and Objective:** In January 2025, eight wildfires burned across LA County, destroying over 15,000 structures. The scale and scope of the destruction triggered the mobilization of a massive recovery workforce. Among those involved were day laborers (DLs) and domestic workers (DWs) hired for short-term cleanup and recovery jobs. However, research on the participation of DLs and DWs in disaster recovery is limited. This study aimed to document employment patterns, job tasks, hazard exposures and health outcomes for DL and DW involved in LA wildfire recovery. **Methods:** Through a community-academic partnership between the UCLA LOSH and IDEPSCA and NDLON (organizations that serve and advocate for DLs and DWs), we surveyed 151 workers at two time points about wildfire-related job assignments in Altadena and Palisades. Questions focused on employment arrangements and work tasks, worksite hazards and exposures, personal protective equipment (PPE) use, and health outcomes. Our initial analyses consist of descriptive statistics. **Results:** Based on preliminary results, DLs and DWs typical employers were homeowners, contractors, and community job centers. The most common task performed was cleaning up ash, soot, and debris. Workers reported a number of chemical and physical hazards at job sites. PPE availability and use varied by employer. Common health symptoms include irritation of the respiratory system; respondents also reported experiencing heat illness symptoms. **Discussion:** The results of this research underscore that vulnerabilities exacerbated or mitigated by employers and the need for long-term engagement of DLs and DWs to both track health outcomes and to develop effective interventions.

## 69. Wildfire Crisis Response: Prioritizing Faculty and Staff Well-Being

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**Background:** Health systems require comprehensive, system-based strategies to respond effectively to disasters such as the 2025 Los Angeles wildfires. The UCLA Department of Medicine (DOM), the largest department in the health system with over 1,000 faculty across Southern California, experienced significant disruption during the Palisades and Eaton fires, with many faculty and staff displaced or losing their homes. **Hypothesis:** A structured, wellbeing-focused action plan can effectively support faculty and staff during and after a large-scale natural disaster and may serve as a model for other health care organizations. **Methods:** UCLA DOM leadership and the Office of Wellness developed a multi-component action plan centered on workforce wellbeing. Key components included: (1) Communication: Daily updates consolidating local government information and organizational resources, transitioning to weekly and then monthly as the crisis stabilized. (2) Rapid Identification and Needs Assessment: One-on-one outreach to all directly impacted personnel to assess immediate needs, including housing, supplies, and childcare. (3) Resource Mobilization: Coordination with human resources on catastrophic leave options; provision of discounted hotel blocks and UCLA housing; creation of a supply donation bank; and dissemination of financial, legal, childcare, and mental health resources. (4) Ongoing Support: Facilitated listening circles led by psychotherapists; panel discussions with individuals who had previously lost homes in wildfires; annual wellbeing assessments to evaluate wildfire-related impact; and continuous reevaluation of evolving needs. **Results:** Implementation of this plan enabled timely identification of affected individuals, rapid mobilization of material and emotional support, and consistent dissemination of relevant information, contributing to workforce stabilization throughout the crisis. **Conclusion:** A comprehensive, wellbeing-centered disaster response plan can effectively support health system personnel. The UCLA DOM model may be adapted by other departments or organizations to prioritize workforce wellbeing during future disasters.

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