

Report from the Field

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Rapidly Mapping Exposure Research Following the 2025 LA County Wildfires: A Public Health Extreme Event Research (PHEER) Network Response

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Abstract

Objective: Mounting evidence indicates a strong correlation between wildfire smoke exposure and health impacts, though limited studies have focused on urban fires or exposures other than smoke. The 2025 LA County Fires presented an opportunity to broaden this evidence base.

Methods: In response, the Public Health Extreme Events Research (PHEER) Network developed an ArcGIS Online health exposure map to curate and disseminate information about environmental exposure data collection activities across agencies and researchers.

Results: The map integrates data collection locations with publicly available datasets to reduce duplication of effort. PHEER also partnered with the University of Washington's Natural Hazards Reconnaissance (RAPID) facility to collect hyperspectral imagery for analysis. Concerns about sharing granular exposure data led PHEER to prioritize disseminating locations and types of data collected rather than the data itself.

Conclusion: PHEER's approach provides a model for supporting rapid, ethical disaster research in complex urban fire contexts.

Introduction

Over the past several years, the public health research community has paid increasing attention to the health impacts of wildfires, particularly smoke exposure. Mounting evidence indicates a strong correlation between wildfire smoke exposure and respiratory impacts, and research has also suggested smoke exposure is associated with neurologic and cardiologic health outcomes.¹ However, much of this research has been related to smoke generated from wildland, versus urban, fires, whose source of combustion is natural forest rather than human development, which may contain a different mixture of toxic and engineered pollutants. Moreover, limited evidence exists on the impacts of other non-smoke exposures, such as reentry to fire-affected homes, schools, or other buildings.²

In early January 2025, a devastating series of wildfires, including the Palisades and Eaton Fires, ignited in Los Angeles (LA) County, California, and spread rapidly under intense Santa Ana winds.³ The Palisades Fire burned through the coastal and canyon communities of Pacific Palisades, Topanga Canyon, and parts of Malibu, eventually damaging or destroying more than 18,000 structures.⁴ The Eaton Fire erupted in the foothills east of Pasadena near Altadena and engulfed neighborhoods that span the wildland-urban interface, causing massive structural losses.⁵ Collectively, these fires consumed more than 35,000 acres in and around LA County, making them among the largest urban-interface fires in the region's history.^{4,5} This urban conflagration presented research opportunities to improve understanding of the health impacts of wildfire smoke and other exposures (e.g., ash, soil, and water) that result from the combustion of urban environments.

The Public Health Extreme Events Research (PHEER) Network is a unique researcher-led network that coordinates and supports the rapid mobilization of a community of practice during time-sensitive public health disasters and emergencies. PHEER was launched in 2022 with funding from the Centers for Disease Control and Prevention (via an interagency agreement with the National Science Foundation) with a mission to support the deployment and dissemination of rapid public health disaster research. Currently, 384 professionals have joined the PHEER Network, reflecting a seasoned, methodologically and geographically diverse research workforce from 23 countries, 38 U.S. states, Washington DC, Puerto Rico, and Guam. To accomplish its mission, PHEER has a governance structure and a Concept of Operations Plan (CONOPS) to mobilize and coordinate this distributed network of researchers. PHEER is led by

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4 co-directors and an external Steering Committee who oversee the operations of the Network, including identifying opportunities for collaboration, research, capacity-building efforts, conducting field epidemiology, and facilitating communication among members and external partners.

Discussion

In response to the LA County Wildfires, PHEER leadership convened a task force of PHEER members, Los Angeles-based researchers, and members of the National Institute of Environmental Health Sciences (NIEHS) Disaster Research Response (DR2) network in January 2025 to discuss what type of mobilization would be most helpful to the local research and public health practice community. These groups identified a need for coordination among researchers interested in collecting data on the wildfires. To aid in this coordination, PHEER developed a wildfire health exposure map in ArcGIS Online that is freely available to the research, practice, and policy communities.⁶ The objective of the map was to collect and curate critical exposure measurements, including environmental exposures from the fire and smoke as well as secondary hazards associated with contaminated soil, air, water, and debris. Researchers may integrate these exposure data with health outcome data to study the health impacts including disease incidence and healthcare utilization. PHEER also partnered with the Natural Hazards Engineering Research Infrastructure's (NHERI) Natural Hazards Reconnaissance (RAPID) facility at the University of Washington to collect perishable hyperspectral imagery in select census blocks within the burn areas of the Palisades and Eaton Fires in March 2025. These data will be publicly available in 2026 on the NHERI DesignSafe data curation platform, which provides tools for researchers to manage and share natural hazards data. PHEER also awarded a grant to a team of researchers to process the hyperspectral data and analyze the spatial impact of contaminants in the burn zones.

After the fires, the Los Angeles County Department of Public Health (LACDPH) created an online dashboard to share information on active or proposed environmental and health assessments. PHEER gathered information from this website and from an ArcGIS-based survey sent to the PHEER leads' networks. When available, PHEER recorded assessment type (soil, water, outdoor air, indoor air, debris water, biological, or ash), assessment targets (particulate matter, heavy metals, or other contaminants), study site(s), and the estimated timeline for each study. Additionally,

PHEER and LACDPH aligned their efforts, deciding that the tools would serve the research community and the public, respectively. In March and April 2025, PHEER attended several of LACDPH's "Wildfire Impact Monitoring Dashboard Implementation Team" meetings to share progress on the map with partners and researchers collecting wildfire data.

After gathering information on the studies, PHEER created an ArcGIS Online Web Application using the Experience Builder tool. The web application hosts a map of the study locations as well as publicly available secondary datasets including the California Department of Forestry and Fire Protection (CAL FIRE) Damage Inspection (DINS) dataset, current AirNow air quality monitoring sites, Environmental Protection Agency (EPA) parcel clean-up data, wildfire perimeters, and the Centers for Disease Control and Prevention's (CDC) 2022 social vulnerability index (SVI) data. PHEER added the census blocks layer to encourage a standard geographic unit of analysis for future research. The links to these data sources are provided in the [supplemental table](#). Studies were added to the map as investigators shared information with PHEER directly, when a spatial file was added to the LACDPH dashboard, and from internal web applications, ArcGIS online accounts, or websites. A few studies on the LACDPH dashboard did not provide any information on their data collection locations, so they were not included on the map. The conceptualization and development of the map took place from January to November 2025, and the PHEER team will add future studies to the map if relevant ([Figure 1](#)).

Studies were categorized as surface studies (including soil, debris, and indoor contaminants), water studies, outdoor air studies, and indoor air studies. The studies with point data within each category were visualized with a distinct symbol that represents the study type (e.g., park bench for outdoor air, home for indoor air). Polygonal data were visualized with outlines or transparent shapes to ensure readability of the map, and color consistency was prioritized throughout the studies within each category. Clicking on a data collection location prompts a pop-up with information about the study, including study team names, study affiliation, study assessment type and targets, primary point of contact email, and a link to the study website or section on the LACDPH dashboard. Finally, a spreadsheet with information about each study that is linked in the web application is provided so users can easily sort and filter study types in a tabular format.

While the map was generated to address gaps in coordination related to exposure assessment, it was challenging to explain the

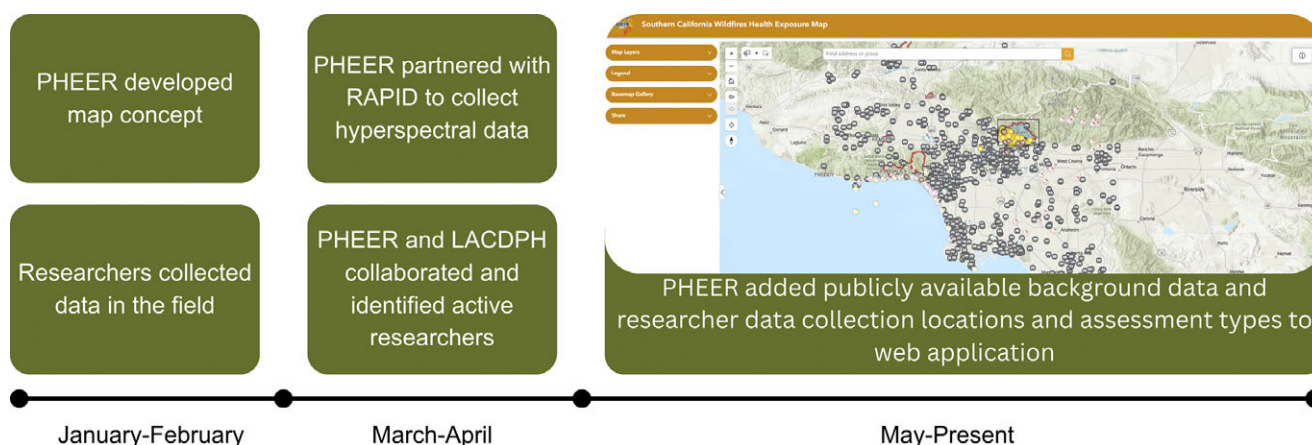


Figure 1. Timeline of map development and collaboration process.

mission and capabilities of PHEER to researchers and practitioners who were immersed in the response and often personally affected by the fires. Initially, PHEER planned to host the data from each study on this map or the DesignSafe platform so investigators could directly download and use data from other studies. A few researchers expressed a willingness to share their data in this way, though several of their data sources were already publicly available. Partners and researchers attending LACDPH's wildfire data meetings expressed hesitancy about sharing data publicly because combining household-level datasets might compromise privacy. There were also concerns that the presentation of data at the parcel level could have unintended negative consequences on affected community members, such as effects on real estate values. Moreover, even if sharing or resharings data from a single source on a map interface had limited risk, bringing multiple sources together could facilitate triangulation of information that could potentially be harmful. To address this concern, PHEER chose to display the locations and types of data being collected, rather than the data itself. Map users can download publicly available data from the agency that collected it or contact the researcher directly if they are interested in accessing research data. Additionally, to ensure that data collection locations could not be linked to specific parcels, the map symbols are only visible at the street level, rather than the parcel level. More conversations among the disaster science and practice communities, inclusive of those impacted by disasters, are necessary to identify pathways for negative consequences of data sharing, mitigation opportunities, and standards of practice.

Conclusion

After the 2025 Palisades and Eaton Fires, the PHEER Network mobilized to support the coordination of environmental exposure data collection among researchers and government agencies. PHEER developed an online web map application to map the locations and types of data collected after the fires. This resource enables researchers to identify existing data collection efforts and encourages them to directly contact project leads to request access to their datasets. Because many studies involved sensitive household-level information, PHEER elected not to display the

underlying data on the map, even when publicly available, to safeguard the privacy of affected communities. By prioritizing coordinated communication, spatially represented study locations, and responsible data stewardship, PHEER's approach provides a model for supporting rapid, ethical disaster research in complex urban fire contexts.

Supplementary material. The supplementary material for this article can be <http://doi.org/10.1017/dmp.2026.10309>.

Author contribution. All authors contributed.

- Substantial contributions to the conception or design of the work, or the acquisition, analysis, or interpretation of data for the work;
- Drafting the work or revising it critically for important intellectual content; and
- Final approval of the version to be published.
- Agreement to be accountable for all aspects of the work and to ensure that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Competing interests. None.

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