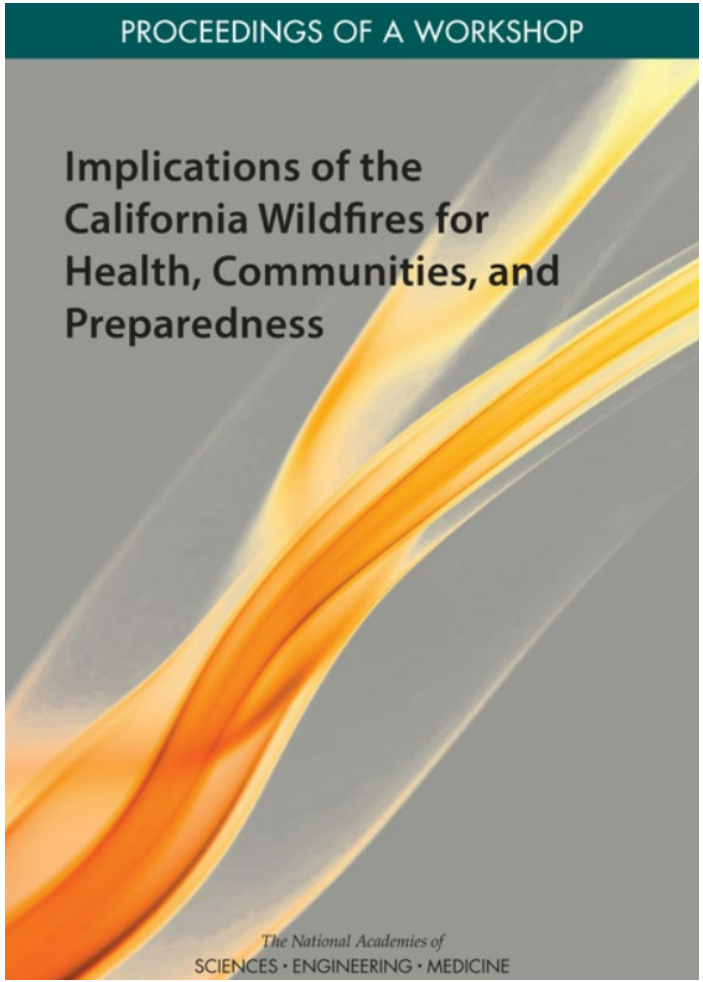


2019 Workshop focused on:

- Wildfire & Inequities
- Health Effects
- Response & Recovery
- Preparedness & Living with Fire
- Research Needs

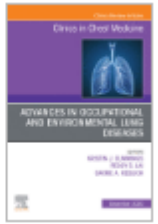
 |

Research needs

- “We don’t know much more than we know,”
- Much basic biomedical research is still needed, for example, the physiological mechanisms of smoke inhalation are still uncertain.
- How to estimate exposure to wildfire smoke or other contaminants from wildfires.
- Lack of research on recovery as a community process.
- Need for more research on structural inequities at the local levels in recoveries.


Progress Made

Clinics in Chest Medicine
Volume 41, Issue 4, December 2020, Pages 763-769



Working in Smoke:: Wildfire Impacts on the Health of Firefighters and Outdoor Workers and Mitigation Strategies

Kathleen Navarro PhD, MPH

National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, 1090 Tusculum Avenue MS 13, Cincinnati, OH, USA

Available online 2 November 2020, Version of Record 2 November 2020.

The mental health and well-being effects of wildfire smoke: a scoping review

David P. Eisenman & Lindsay P. Galway

BMC Public Health **22**, Article number: 2274 (2022) | Cite this article

Abstract

Background

Smoke from wildfires is a growing public health risk due to the enormous amount of smoke-related pollution that is produced and can travel thousands of kilometers from its source. While many studies have documented the physical health harms of wildfire smoke, less is known about the effects on mental health and well-being. Understanding the effects of wildfire smoke on mental health and well-being is crucial as the world enters a time in which wildfire smoke events become more frequent and severe. We conducted a scoping review of the existing information on wildfire smoke's impact on mental health and well-being and developed a model for understanding the pathways in which wildfire smoke may contribute to mental health distress.

GeoHealth

RESEARCH ARTICLE

10.1029/2021GH000457

Estimated Mortality and Morbidity Attributable to Smoke Plumes in the United States: Not Just a Western US Problem

Katelyn O'Dell[1], Kelsey Bilsback[1], Bonne Ford[1], Sheena E. Martenies[2], Sheryl Magzamen[3], Emily V. Fischer[1], and Jeffrey R. Pierce[1]

[1]Department of Atmospheric Science, Colorado State University, Fort Collins, CO, USA, [2]Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Urbana, IL, USA, [3]Department of Environmental and Radiological Health Sciences, Colorado State University, Fort Collins, CO, USA

Special Section:
Fire in the Earth System

Key Points:

- While the majority of large fires occur in the United States (US) West, a majority of smoke-attributable US mortality and morbidity occur east of ~100 degW
- A higher percent of mortality and morbidity is attributable to smoke in high fire-impacted northwestern states, relative to other US states
- Disability-adjusted life years attributable to fine particles in smoke are much higher than that from gas-phase hazardous air pollutants

Supporting Information:

Supporting Information may be found in the online version of this article.

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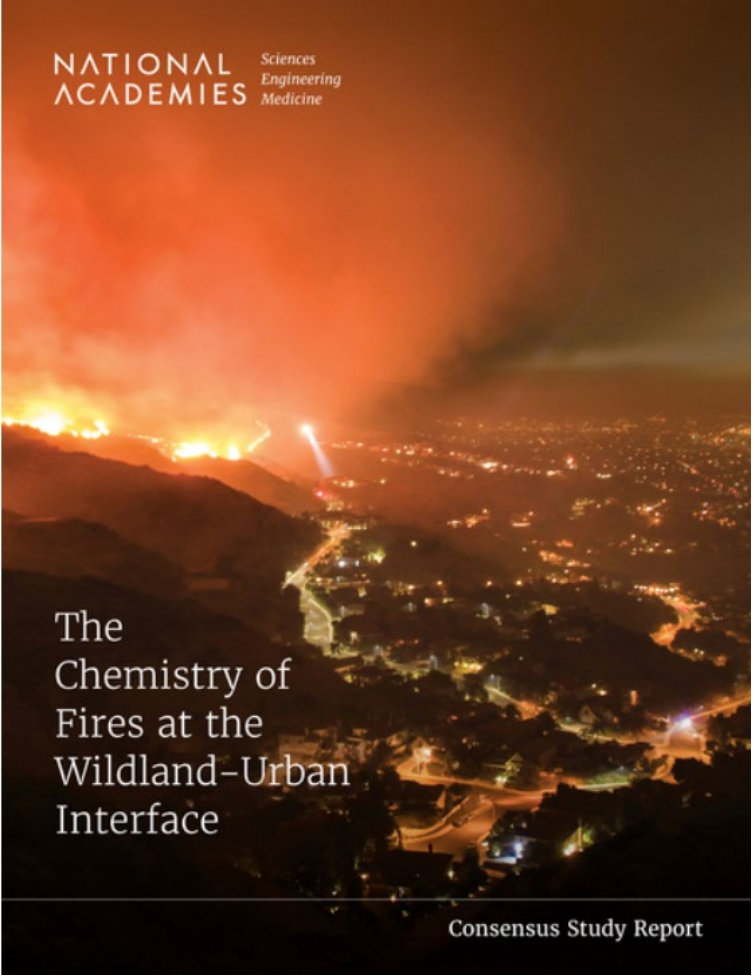
Citation:

O'Dell, K., Bilsback, K., Ford, B., Martenies, S. E., Magzamen, S., Fischer, E. V., & Pierce, J. R. (2021). Estimated

Abstract As anthropogenic emissions continue to decline and emissions from landscape (wild, prescribed, and agricultural) fires increase across the coming century, the relative importance of landscape-fire smoke on air quality and health in the United States (US) will increase. Landscape fires are a large source of fine particulate matter ($PM_{2.5}$), which has known negative impacts on human health. The seasonal and spatial distribution, particle composition, and co-emitted species in landscape-fire emissions are different from anthropogenic sources of $PM_{2.5}$. The implications of landscape-fire emissions on the sub-national temporal and spatial distribution of health events and the relative health importance of specific pollutants within smoke are not well understood. We use a health impact assessment with observation-based smoke $PM_{2.5}$ to determine the sub-national distribution of mortality and the sub-national and sub-annual distribution of asthma morbidity attributable to US smoke $PM_{2.5}$ from 2006 to 2018. We estimate disability-adjusted life years (DALYs) for $PM_{2.5}$ and 18 gas-phase hazardous air pollutants (HAPs) in smoke. Although the majority of large landscape fires occur in the western US, we find the majority of mortality (74%) and asthma morbidity (on average 75% across 2006–2018) attributable to smoke $PM_{2.5}$ occurs outside the West, due to higher population density in the East. Across the US, smoke-attributable asthma morbidity predominantly occurs in spring and summer. The number of DALYs associated with smoke $PM_{2.5}$ is approximately three orders of magnitude higher than DALYs associated with gas-phase smoke HAPs. Our results indicate awareness and mitigation of landscape-fire smoke exposure is important across the US.



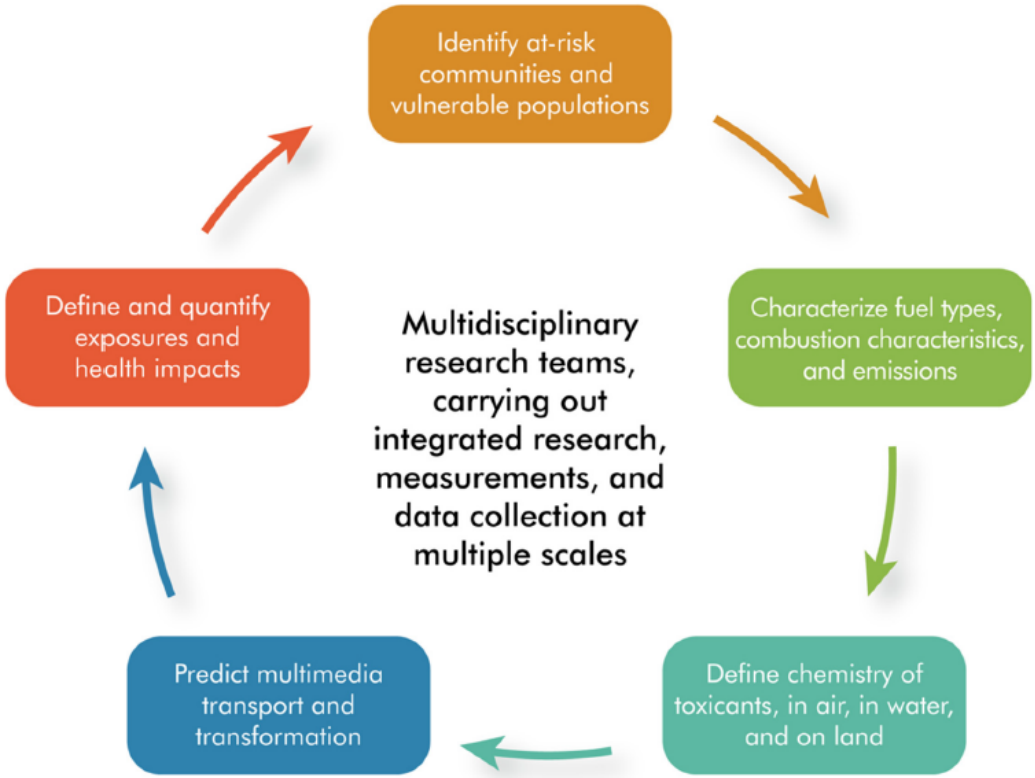
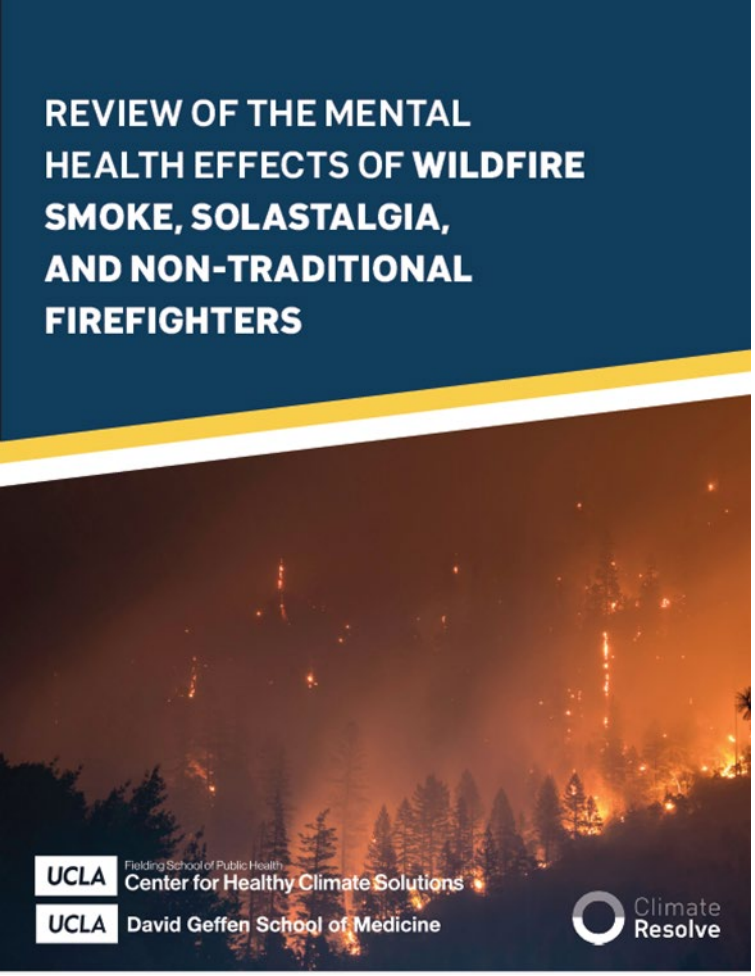


FIGURE S-1 The interdependence of multidisciplinary WUI fire emission research activities.



Wildfire Smoke Exposure

Mediators

Reduced physical activity	Feelings of stress and uncertainty	Evacuation	Cerebral hemodynamic changes
Reduced summer outdoor activities	Previous negative health impact from smoke	School relocation	Impaired sleep quantity and quality
Reduced access to livelihood	Negative reminders	Business closures	Removal from daily routine
Food Insecurity	Fear of leaving home	Isolation from community	Family stress from disruptions; violence

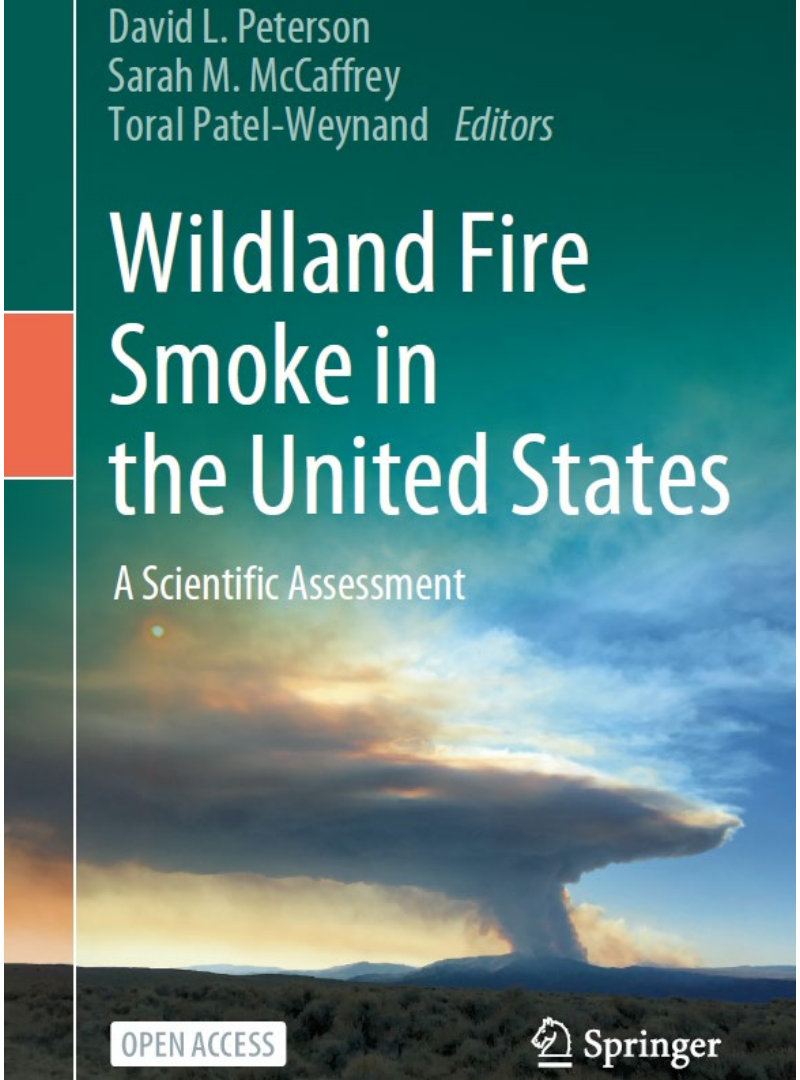
Psychological Health and Well-Being

EPA

https://www.epa.gov/smoke-ready-toolbox-wildfires

EPA, the USDA Forest Service, and other federal, state and community agencies and organizations are working together to identify ways the public can prepare to reduce their health risk before a wildfire.

Public health officials and others can use the resources in the Smoke-Ready Toolbox to help educate people about the risks of smoke exposure and actions they can take to protect their health.



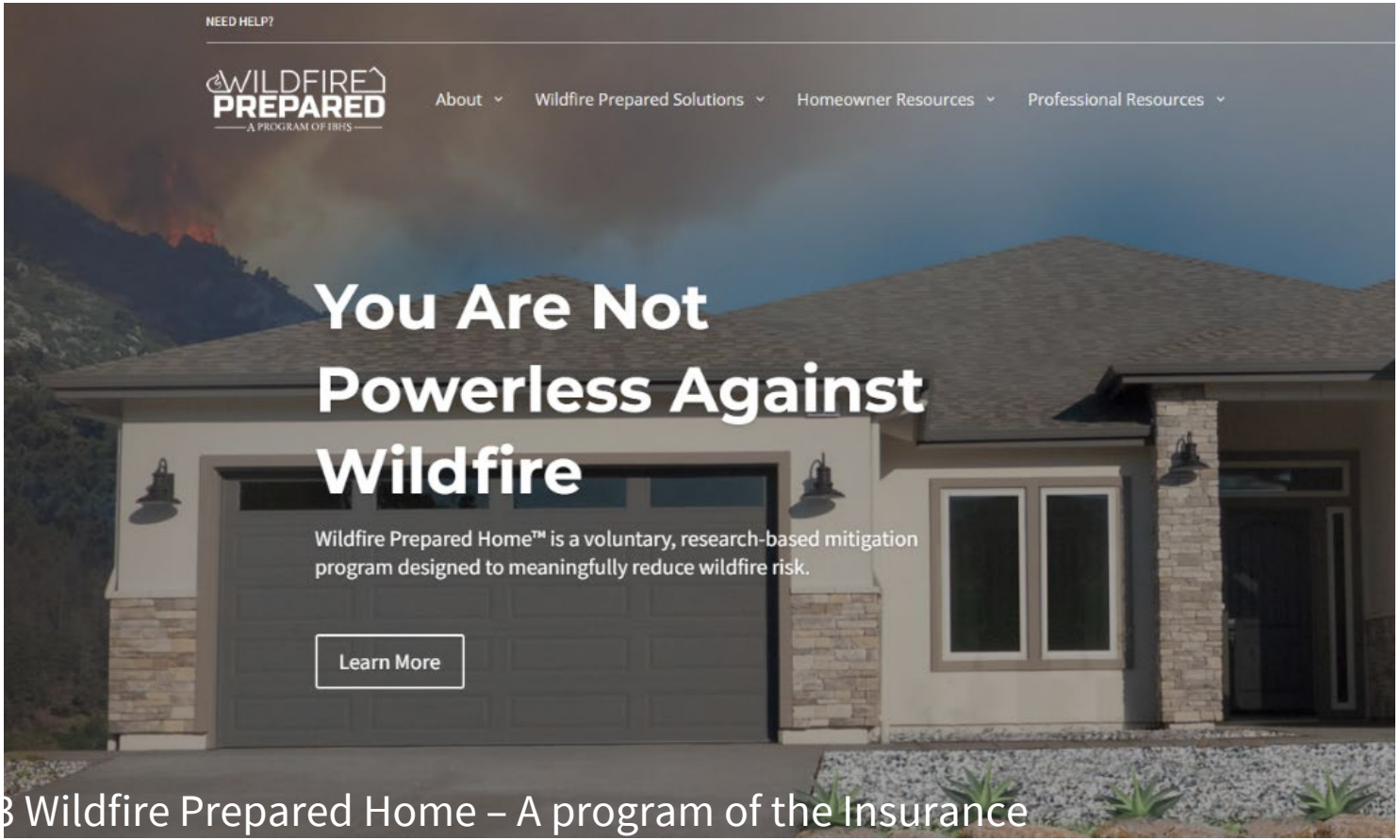
2022 US Forest Service,

The Wildland Fire Smoke Science Assessment documents the state of smoke-related science from past to present and provides insights into future needs. The assessment was motivated, at least in part, by recent wildfire years with substantial smoke impacts in the continental USA.

A Call to End the Destruction of Communities by Wildfire in 30 Years

1. Require all homes and business in the wildland urban interface (WUI) to be more resistant to ignition from wildfire embers and flames
2. Current codes and standards, as well as sound land use practices must be in use and enforced for new development and rebuilding in wildfire-prone areas
3. Fire departments for communities in the WUI must be prepared to respond safely and effectively to wildfire
4. Government must increase resources for vegetative fuel management on public land
5. The public must understand its role and take action in reducing wildfire risk

https://www.nfpa.org/wildfirepolicy



3 Wildfire Prepared Home – A program of the Insurance

https://wildfireprepared.org/

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chemicalinsights.org

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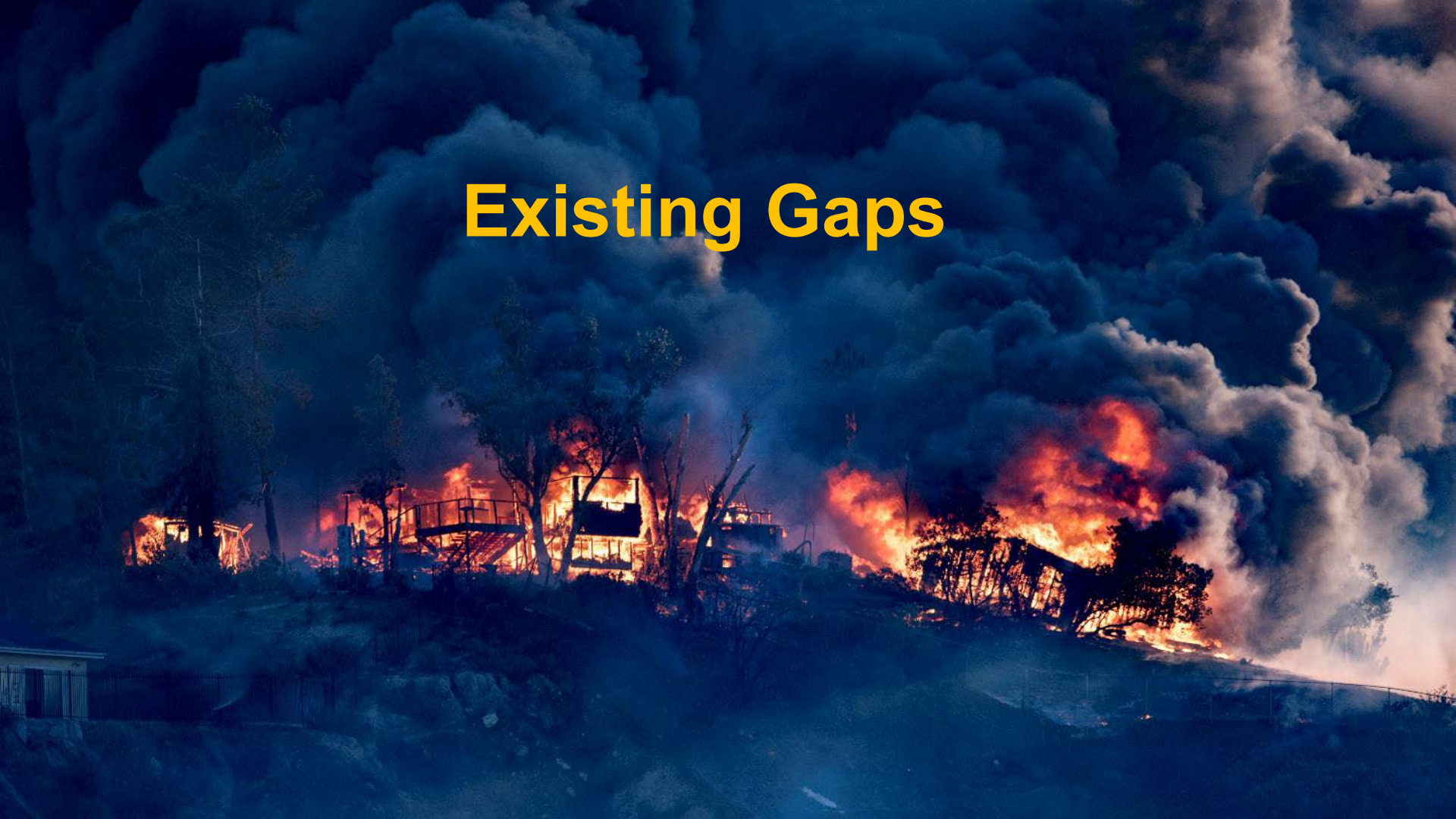

Existing Gaps

Existing Gaps

Policies to protect Wildland Urban Interface from Wildfires inadequate.

No progress on research on recovery or structural inequities in recovery.

Opportunities

148 Recommendations