

# The Fossil Fuels behind Forest Fires in California

## *Quantifying the Contribution of Major Carbon Producers to Increasing Wildfire Risk*

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Over the past several decades, almost all aspects of wildfires have worsened across the forests of western North America. Fueled by climate change, wildfires are burning larger areas, more severely, at higher elevations, and over a lengthening fire season. Wildfires are taking a heavy toll on Californians: From 2017 to 2021, California experienced more than 45,000 wildfires that burned a total of more than 9.5 million acres, destroyed more than 51,000 homes and businesses, and claimed 186 lives. Notably, California's eight largest wildfires on record have all occurred since 2017.

With the impacts and costs of wildfires—and climate change more broadly—growing increasingly severe, many legal and policy questions have arisen: Who is responsible for climate change? How much responsibility does each entity bear? What is the obligation of those entities to pay their fair share of the costs? These questions particularly apply to the fossil fuel industry: as major fossil fuel companies and their industry associations have been aware since the 1960s that the use of fossil fuels would negatively affect Earth's climate, and they nonetheless carried out decades-long disinformation campaigns that sowed doubt about the causes of climate change (Franta 2018).

This analysis by the Union of Concerned Scientists uses a combination of data and scientific modeling to determine what portions of the observed increases in fire-danger conditions and burned forest area across western North America can be attributed to the world's 88 largest fossil fuel companies—including ExxonMobil, BP, Chevron, and Shell—and cement manufacturers. The analysis finds that 48 percent of the rise in fire-danger conditions<sup>1</sup> in western North America since 1901 can be traced to carbon emissions from these companies. In addition, 37 percent of western North America's cumulative burned forest area since 1986 can be traced back to those emissions (see Figure 1, p. 2).

Emissions from the products of fossil fuel companies and cement manufacturers have fundamentally reshaped the climate of western North America and left behind a scarred, charred

landscape in which people, communities, and the ecosystems that enable their existence are suffering. Tribal, rural, historically disadvantaged, and low-income communities are disproportionately affected by these impacts of wildfires because of longstanding racism and marginalization. While California is making progress in addressing wildfire risk, the resilience-building needed is vast, and, to date, the general public has largely been footing the bill. This analysis underscores the responsibility of fossil fuel companies for a portion of the impacts and costs of coping with wildfires and climate change.

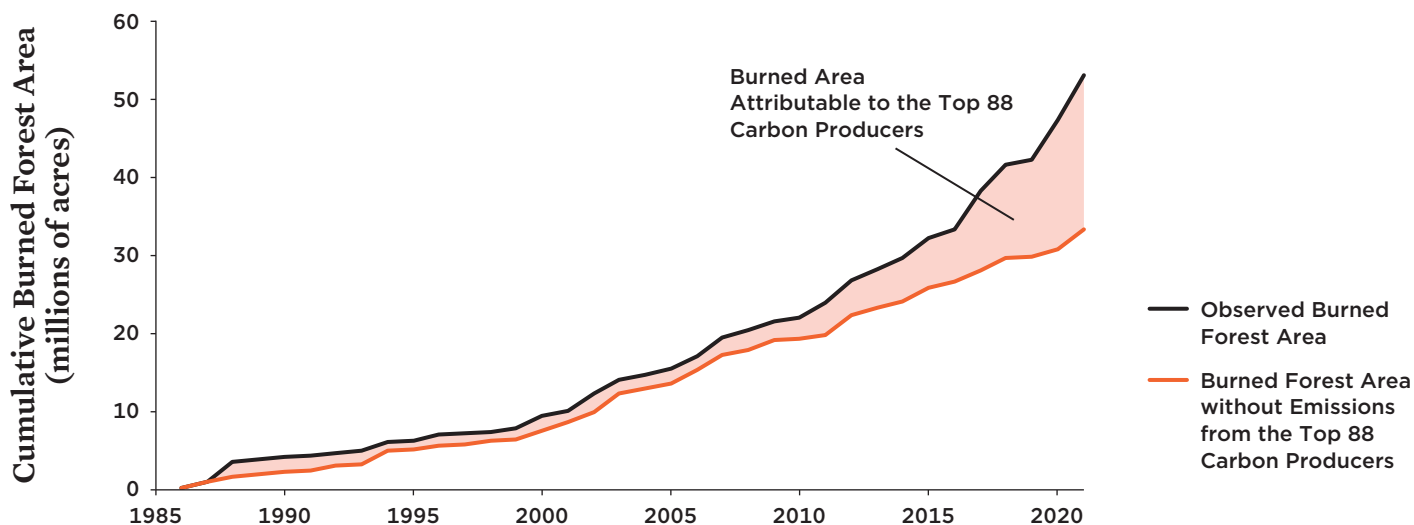
### **Fossil Fueled Wildfire Impacts in California**

The consequences of wildfire extend beyond a burn scar and can impact the health of communities, water supplies, and economies long after a fire is extinguished.

Catastrophic wildfires are a driving factor behind California's consistently poor air quality and negatively impact the health of people in the state. Excessive smoke exposure during 2020's record-breaking wildfires has been linked to up to 3,000 indirect deaths; 4,800 extra emergency room visits; and increased risk of COVID-19 illness and death (Deryugina et al. 2019; Burke and Heft-Neal 2020; Zhou et al. 2021). In the Central Valley, which produces roughly 25 percent of our nation's food supply, wildfires worsen already poor air quality and increase health risks for the region's more than 800,000 outdoor workers (Licker, Dahl, and Abatzoglou 2022). These health costs are passed on to individuals, social service organizations, and medical insurers.

Severe wildfires can also disrupt processes that maintain access to drinking water. By disturbing soil and removing the stabilizing effect of roots, severe wildfires followed by intense rains can increase sediment and toxins in waterways and reservoirs, and lead to mudslides, like those seen in Montecito in 2018

FIGURE 1. The Top 88 Carbon Producers' Contribution to Burned Forest Area



By making the climate of western North America more fire-prone, emissions traced to the products of the world's 88 largest fossil fuel companies and cement manufacturers contributed 37 percent of the total forest area burned in the region since 1986 (the earliest year for which reliable burned-area estimates are available). Observations show that, across the region, 53.0 million acres of forested land has burned since 1986. Nearly 19.8 million acres of that burned area is attributable to emissions traced to the 88 carbon producers.

SOURCE: DAHL ET AL. 2023.

following the Thomas fire. Los Angeles County Public Works, for example, plans to spend \$190 million dredging four reservoirs impacted by sediment from the 2009 Station fire (Bland 2017). Many of these costs are then passed on to consumers through higher energy and water bills.

In economic terms, wildfires lead to millions of dollars in damages annually, while suppression costs—both in California and nationwide—continue to climb. Between 2017 and 2021, California's emergency fire suppression costs exceeded \$4 billion, and economic damages from wildfire surpassed \$21 billion (CalFire 2022). But these staggering totals actually underestimate the true cost of wildfire. They represent the value of lost property and possessions, but fail to incorporate damages like business interruptions, lost wages, and supply chain disruptions.

Lastly, there is great environmental damage. As wildfires burn, the combustion of soil, vegetation, and infrastructure releases heat-trapping gases like carbon dioxide (CO<sub>2</sub>) that further amplify climate warming. Between 2017 and 2021, wildfires in California released an average of 53 million metric tons of CO<sub>2</sub>-equivalent annually (CARB 2022; Table 1). In extreme wildfire years like 2020, those emissions can be more than double that average. Failing to curtail fossil fuel use would likely result in increased wildfire activity and emissions, which would, in turn, make California's appropriately ambitious emissions-reduction goals more difficult to achieve.

## Holding Fossil Fuel Companies Accountable

Holding companies accountable for the harms they have caused through both their emissions and their disinformation campaigns is critical to supporting and advancing efforts to build wildfire resilience. State governments and public officials have important roles to play in demanding accountability. For example, they should:

- Preserve access to justice through the courts for people and communities experiencing climate impacts.
- Take into account the major financial and economic risks posed by climate change when making investment decisions on behalf of constituents.
- Use every tool at their disposal to pressure fossil fuel companies and their investors to:
  - stop engaging in greenwashing and funding the spread of climate disinformation.
  - fully disclose the climate impacts and economic risks of their businesses.
  - update their business models to enable sharp emissions reductions from their products and operations at a pace and scale consistent with the goals of the Paris Agreement on climate change.

TABLE 1. California Wildfire Impacts, 2017–2021

Year	Number of Fires	Area Burned (acres)	Structures Lost	Damages (USD)	Suppression Costs (USD)	CO <sub>2</sub> Emissions (million metric tons)
2017	9,560 fires	1,266,224 acres	12,016	\$12 billion	\$534 million	31.3 MMT
2018	8,054 fires	1,823,153 acres	22,867	\$4 billion	\$733 million	39.1 MMT
2019	8,194 fires	259,148 acres	570	\$404 million	\$947 million	4.8 MMT
2020	10,341 fires	4,092,151 acres	11,473	\$4 billion	\$691 million	106.7 MMT
2021	9,280 fires	2,233,666 acres	4,471	\$509 million	\$1,288 million	85.1 MMT

*Wildfires across California are burning increasingly large areas and impacting ecosystems, communities, livelihoods, and human lives. As communities develop in fire-prone areas and people influence the occurrence, frequency, and size of wildfires, more properties and structures are at risk.*

SOURCES: CARB 2022; BARRETT 2022; CALFIRE 2022.

## Additional Policies to Limit Harms from Wildfires

Even with improved corporate accountability, the efforts needed to build wildfire resilience are vast and must be supported by existing, new, and strengthened programs and policies in each of the categories below. Here’s what states can and should do:

### Rapidly Reduce Heat-Trapping Emissions

States must contribute to national and global efforts to rapidly reduce heat-trapping emissions by expanding clean electricity, energy efficiency, zero-emissions vehicles, mass transit, and industry and building electrification, as well as by conserving healthy soils and forests.

### Reduce Human-Ignited Wildfires

States should enact legislation directing electric utilities to plan and implement measures that prevent energy infrastructure from sparking fires while also engaging communities, protecting ecosystems, and ensuring the continued functioning of critical equipment. State governments should require the adoption of defensible-space standards and other risk-reduction standards along with the latest building codes for structures in high-risk areas.<sup>2</sup>

### Increase Resources for Forest Health

States must: (1) allocate and sustain funding for identifying at-risk forests, (2) scale up forest treatments using science-informed strategies, and (3) reduce barriers to and encourage the use of prescribed fire on state lands and in conjunction with private landowners and local and tribal stakeholder communities. In doing so, it is imperative to respect tribal sovereignty, traditional ecological knowledge, cultural traditions, and local stakeholder input.

## Protect Community Health and Safety

States must implement strong public health regulations and programs that protect vulnerable populations from direct and indirect threats from wildfires, including threats to air and water quality. State and local zoning regulations should also limit development in the wildland-urban interface and invest in safe, affordable housing elsewhere. In addition, state lawmakers must ensure that fire insurance policies are transparent and affordable, and include pricing that accounts for wildfire mitigation measures.

## Advance, Track, and Help Coordinate Equitable Investments

The impacts of wildfire often fall most heavily on people with the fewest resources to cope. States must identify and prioritize low-income, at-risk communities for resilience-building measures. To ensure the efficacy of resilience investments, states should also bolster their capacity to receive and distribute federal funding.

## Endnotes

1. This analysis used vapor pressure deficit (VPD) as a measure of fire-danger conditions. VPD is the difference between the amount of moisture that is actually in the air and the amount of moisture that air would hold if saturated. For more information, see [www.ucsus.org/resources/fossil-fuels-behind-forest-fires](http://www.ucsus.org/resources/fossil-fuels-behind-forest-fires).
2. Structural ignitability and defensible space, an area around a structure that is designed to reduce fire risk, are key components of protecting properties from wildfire. For more information, see <https://csfs.colostate.edu/wildfire-mitigation/protect-your-home-property-from-wildfire/>.

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[www.ucsusa.org/resources/fossil-fuels-behind-forest-fires](http://www.ucsusa.org/resources/fossil-fuels-behind-forest-fires)  
[es.ucsusa.org/recursos/los-combustibles-fosiles-detras-de-los-incendios-forestales](http://es.ucsusa.org/recursos/los-combustibles-fosiles-detras-de-los-incendios-forestales)

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