The complex causes of the wildfire disaster in California

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Summary

This paper examines the complex causes of wildfires at the start of the "fire season" in California and outlines strategies for combating the causes and effects of wildfire disasters in the region. Based on the finding that climate factors play a role as both immediate and long-term drivers of the likelihood and intensity of wildfires in California, this paper focuses specifically on the non-climatic factors that contributed to the 2024–25 California wildfire disaster. The analysis is based on the recognition that vulnerability, exposure, decision-making processes, and other human influences caused this wildfire disaster at various levels: some specifically for the current wildfire, other more generally for wildfires in California, and a few at its core for wildfire risks in the western United States. To understand the fundamental causes, we look back to the post-Civil War era when water rights were first negotiated and allocated by the US based on the amount of water available at the time.

I. Introduction

The wildfires in Los Angeles are poised to be a turning point for how homes are built and insured across the United States. The harrowing images from the Palisades and Eaton (Altadena) neighborhoods are unforgettable, underscoring the immense destruction: 29 lives lost, 180,000 residents evacuated, 15,000 hectares scorched, over 16,000 structures gone, and around $75 billion in insured damages caused (Galizia, 2025). Total property and capital losses could range between $95 billion and $164 billion. (Anderson, 2025). Even in fire-prone California, the scale and intensity of these fires far exceeded any expectations based on past experience. Although the current wildfires are by far not the biggest if measured by acreage scorched and structures destroyed, they are the most "public" given their locations and the amount of property and capital loss. According to the Western Fire Chiefs Association, these wildfires were "the most destructive in Los Angeles' history" (WFCA, 2025).

The fires were unquestionably driven by climate change. Extended dry seasons are a key factor. Previously, dry conditions in California lasted only until December, at which point rains normally would reduce the likelihood of dry vegetation igniting. Now, the droughts persist into January, leaving arid conditions facing the arrival of the fierce Santa Ana winds from the inland deserts that can spread sparks and embers for miles. As global temperatures continue to rise, California's dry seasons are

likely to lengthen even further. Additionally, the Pacific Ocean's cooling influence, which usually mitigates some fire risk, is expected to weaken as sea temperatures globally climb. A study by World Weather Attribution estimates that climate change has already increased the likelihood of wildfires by about 35 % and their intensity by about 6 %, measured by the Fire Weather Index.

While climatic conditions played a role in causing the fires, they have not yet been a major factor in shaping their social and economic costs. The evidence suggests that non-climatic factors such as political concerns, regulatory policies, and economic inequality have played a significantly larger role than climate change itself in fueling the longer-term impacts of this particular disaster.

In this paper, we are looking into the non-climate factors of the California wildfire disaster of 2024–25. Our analysis begins with an understanding that vulnerability, exposure, decision-making processes, and other human influences have been causing this wildfire disaster at different levels: *Specifically* for the current wildfire, more *generally* for Californian wildfires and at the core of wildfire risks in America's west and the U.S. by getting to its *root causes*, while recognizing climate factors as both immediate and long-term drivers of probability and intensity of "natural hazards". We argue, however, that "natural disasters" are fundamentally human-made (following Wisner, Gaillard, and Kelman, 2011), resulting from the actions of those with power, resources, and decision-making authority ultimately placing others at risk of disaster. Swiss writer Max Frisch previously captured this idea in his 1979 book *Man in the Holocene*, stating, "Only man knows natural disasters, so far as he survives them. Nature does not know disasters". With this perspective, our paper explores the complex causes of the current wildfires and examines strategies to eliminate the cause-and-effects of wildfire disasters in the region. To understand the root causes, we must look back as far as to the period following the Civil War, when water rights were first negotiated and allocated by the U.S. based on the volume of water flow then available.

The paper is structured as follows: Part I examines the *specific* features of the wildfires (Who has been impacted and where the fires took place; the number of fires in close proximity to each other; the structure and value of the built environment that is being lost; the acute structural underinsurance of properties, and the politics of misinformation and climate denial in the U.S. Part II considers the *structural* drivers of wildfires in California and the U.S. (Urban sprawl; vulnerability of residential buildings, the complex interplay of ignition sources and organizational challenges in early warning and firefighting). Part III addresses the historical water and grazing rights allocation in America's west and the enduring building boom in high-risk zones in the U.S. as *root causes*. Part IV reviews the factors contributing to the high and continuing economic and social costs of the fires, and then we derive some conclusions and lessons in Part V.

II. Specific features of the current L.A. wildfires

Where the fires took place

The current wildfires, like many before them, took place in the Los Angeles Metropolitan Area. Some have been in very elite neighborhoods, populated in part by very public figures: the super wealthy, television and movie personalities, political personalities, etc. The largest is the Palisades Fire, which burned in an area with hills, canyons, twisting roads, and other elements that impeded firefighting efforts. Others were in less affluent areas, with better road systems but not necessarily greater capacity for firefighting.

Much of the built environment in the area predates zoning or land use codes. Hence, structures, especially homes, were built for view, prestige, etc. and not according to some building code or city plan. The civic infrastructure for fire suppression, such as fire hydrants and the pipes feeding them – where such infrastructure exists, dates to the development of rural residences. The water flow capacity is thus totally inadequate for the build-out and increased density of land uses that have taken place since the end of World War II.

Number of fires

The largest conflagration was the Palisades Fire that destroyed close to 7,000 structures (CalFire, 2025A). Pacific Palisades is for the most part a very wealthy community. Its residents include television and movie stars, political personalities, and others with exceptional wealth. Some of the property owners, however, arrived before the property values skyrocketed, were protected from rising costs by California's property tax limits, and may at best be middle class. Topographically, the neighborhood's hills, canyons and narrow, twisting once-rural roads made reliance on large mobile equipment for fighting fires difficult if not impossible. To confound things, the individual home sites of the wealthy and the famous covered multiple hectares. While they had manicured lawns and gardens near structures, they left significant land area as unmanaged forest in order to preserve their privacy. Those wooded areas became fuel for the fires and accelerated their spread.

Other fires of note occurred at the same time in 2024–25, spreading due to the dry conditions and extremely high winds. The Eaton fire, consuming much of Altadena, just outside the city boundary, destroyed even more structures than the Palisades fire, around 9,500, and damaged over 1,000 others, though it was smaller in size than the one in Pacific Palisades (CalFire, 2025B). It struck less affluent neighborhoods that were far more densely developed and may have caused lower monetary losses as a result, though it likely affected more people. The fire bordered the Los Angeles National Forest, a wildfire's dream fuel source.

For the most part, the fires were within the Los Angeles Fire District. While the District has many resources, it was never designed to fight three or more large wildfires at the same time, even with support from the state firefighting agency, CalFire and nearby local fire companies. As a result, firefighting personnel and equipment pitched in from just about all 50 US States, Canada and Mexico.

Value of the built environment destroyed

The Los Angeles Metropolitan Area includes both areas with homes built for aesthetic and showcase values and others that were developed in locations close to the urban core for middle-class and moderate income homeowners.

Pacific Palisades, the site of the largest fire, was the affluent area with a median home price over $5 million as of January 2025, originally settled decades ago with small houses up twisting roads that were inexpensive because of their relative inaccessibility and need for car ownership. Over time, those hillside sites were rebuilt and forested areas developed into luxury homes, many with ocean views, that appealed to high-income employees ("stars") of the local entertainment industry and other wealthy households seeking privacy. Not wanting to ease public access, the new residents did little to improve the small hillside roads that turned out to limit larger emergency vehicle access.

By contrast, Altadena, an unincorporated area in Los Angeles County adjacent to the city hit by the other fires, had a median home value under $1.3 million, thus at the lower end of the California housing cost scale. (The statewide median home cost, including really isolated rural areas, was over $900,000 as of May, 2024 while the median for inner city homes in Los Angeles itself was just over $950,000.) Altadena offered the locational amenity of proximity to central Los Angeles without the problems and costs of central city living and that accounted for the slightly higher median cost for the homes when compared to those in the city itself. Black families are overrepresented in the area since pervasive discrimination prevented them from buying homes in many other parts of the city or county.

III. Structural drivers of wildfires in California and the U.S.

Urban Sprawl and the loss of agricultural buffer zones

Cities in the U.S. have been spreading outwards since the late 1800s. Historically, that expansion of settlements was driven in part by the same technological factor across the modern world: rail transportation. In the US, that meant "Streetcar Suburbs", built along trolley lines built by private developers to provide access to land they wanted to sell (Warner, 1978).

Mass transportation made it possible for the middle class, not merely the rich, to escape the noise and pollution of the cities after they became manufacturing centers, blighted with the emissions of coal-fired steam power. Mass immigration to the US filled the space in cities opened up by those who could relocate and provided the needed factory labor.

Avoiding the immigrants – as "other" people – was already a factor driving outmigration in the US in a manner that Europe did not experience. "White flight" added to the pressure to move out as African Americans started to migrate north from rural poverty in the South in the early 20th century. Racism became a major driving force of suburbanization and promoted the development of even working-class suburbs.

The mass exodus and demand for new single-family homes after World War II in a country that, unlike Europe, did not need to rebuild from war damage in the 1940s and 1950s account for the extreme spread of urbanization. Many of the working-class suburbs imposed a different burden on some of their residents – extreme distances to primary employment centers. Racist fears led some families to accept those location costs, while the outward expansion of industrial plants seeking space for single-story production processes helped others by bringing employment to the suburbs.

Developers of such suburbs sought lands that would be easy to subdivide, typically nearby farmland. The growing ubiquity of the car enabled the older suburbs built along streetcar lines to expand outward themselves. But uneven topography and forest cover remained a barrier to new development until a new wave of affluence – a levelling of the concentrated wealth of the late 19th century – generated a demand for showcase housing development.

Most cities originated from their reliance on water power before steam engines, so many had riverfront land that provided views, fresher air, and distinctive settings for showcase development. Others were on shorefronts, serving as harbors and transport centers, and they offered seaside sites for the newly affluent. Yet a different group of cities found ways to turn nearby hills and wooded areas into assets rather than barriers to new development.

Vulnerability of residential buildings

The built environment, especially outside cities, in many instances dates to periods in which there was little perceived risk of fires spreading from forests. As sprawl extended to the wildlands-urban interface, however, those fire risks grew – but the building codes did not change. Many older (and even some newer) homes in Los Angeles still have flammable roofs, siding and gutters, making them highly susceptible to the intrusion of fire gases and sparks. Given limited local resources, enforcement of fire safety standards and requirements has been inconsistent, so communities remain at risk, and the buildings in place may contribute to the destructive potential

of an approaching wildfire. Plans for more fire-resilience buildings were proposed for California after the disastrous 2018 Camp fire (Eremita, *et al.*, 2019). However, to date, few citizens have been encouraged, let alone required, to create a 'protective space' around their properties, so the vulnerability to fires remained pervasive in 2025.

Complex interplay of ignition sources

Natural causes, such as lightning strikes, appear to account for only a small fraction of forest fires. In the Los Angeles region, virtually all winter fires (over 95 percent) are human-caused, with arson being a major factor, alongside negligence and accidental ignition (Gibbens, 2018).

Outdated electrical infrastructure–aging power lines and transformers–has also played a significant role, as sparks from failing equipment have frequently triggered fires. However, utility companies face immense financial and logistical challenges in upgrading the aging grid.

Beyond infrastructure issues, social factors contribute to wildfire outbreaks. Some fires are deliberately set by arsonists, reflecting deeper issues linked to crime, mental health, and socioeconomic struggles. Investigations into the Palisades fire in L.A. suggest that smoldering remnants from New Year's Eve fireworks may have been a trigger in an interplay with delayed emergency response (Sacks, *et al.*, 2025), underscoring the complexity of wildfire causes–where systemic infrastructure deficits, individual actions, and organizational failure combine in a dangerous and unpredictable pattern.

Finally, there are the flammability characteristics of native plants in the area. Many like Sagebrush, Chamise, and Castor contain a petroleum-like substance. Once they catch fire, they burn like a gasoline fire would burn. The hills around L.A. are full of these plants.

Los Angeles' Specific Firefighting Problems

Much public blame has been focused on water supply and personnel issues, driven in part by the efforts of President Trump to demonstrate that Californians in general and the policies and actions of Governor Newsom and L.A. Mayor Bass in particular were responsible for the disaster. Those claims obscure a number of more fundamental problems that faced the firefighters.

Yes, the claims that hydrants ran out of water in the Pacific Palisades were correct, and a key reservoir had been drained for repair when the fires broke out, but the firefighting problem was and remains far deeper. *The New York Times* reported in February that 17 % of all city hydrants were obsolete and did not meet modern standards for water flow (Baker and Gebeloff, 2025). In Pacific Palisades the obsolete hydrants,

installed as early as the 1940s, amounted to 24 % of the total. (In another neighborhood known to have high fire risk, Bel Air, 60 % of all hydrants are substandard.)

But old and inadequate hydrants were not the only water supply issue. A local radio news story in February, 2025 "reported that the LAFD had compiled a list of 1,350 fire hydrants requiring repairs" and never sent the list on to the city's Department of Public Works which was responsible for maintaining them (Palumbo, 2025). A report from the LAFD to DPW in August, 2024, never even mentioned the need for repairs and the list of hydrants needing attention was not provided until after the radio station blew the whistle (Hamilton, 2025).

Compounding the firefighting problems in Los Angeles has been its difficulties in maintaining fire trucks and other emergency response vehicles. Reflecting on the fires and justifying her actions after she was removed as LA Fire Chief, Kristin Crowley noted that "We have over 100 fire apparatus out of service. Having these apparatus and the proper amount of mechanics would have helped." (Amalaraj, 2025) Forty actual fire engines were in the shop at the time, and their absence led to some firefighters being sent home as the flames spread since there was no equipment available that could transport them to the fires (Tchekmedyian, 2025; Nicol, 2025).

IV. Root causes

Water and grazing rights' allocation in America's West.

Water is a huge issue in California and the entire western part of the US. And the issue has its roots back to the middle of the 19th century. A quick review of the history of the Los Angeles Basin and its dependence on non-local water makes this clear.

The area of about 4,000 square miles that we now call Los Angeles was once a flood plan for the San Gabriel and Los Angeles Rivers, inhabited mostly by about 5,000 members of the Tongva people. The Tongva were mostly cattle ranchers, and continued this tradition through the area's invasion by European settlers and later Mexican missionaries and settlers. The Tongva existed by selling cattle and other food items, clothing, and, importantly, water. By the 1780's demand for water due to local population increases exceeded what the San Gabriel and Los Angeles rivers supplied, so the Tongva built canals and aqueducts to move the water closer to the center of their settlement. That was the first known local water infrastructure project.

The Tongva did not have a formal land ownership system, nor was such a system established by the initial European and Mexican settlers. Occupancy effectively defined ownership until 1849 and the California gold rush, when the US territorial government began a survey that laid out the area, and instituted formal deeds and brought other ownership instruments to bear. The survey effectively delineated

where various classes lived. The poor were concentrated in the old pueblo, while the elite lived on more land in its outskirts. This pattern was followed into the present where we see the wealthy living in places like Pacific Palisades, Topanga Canyon, and the like.

After oil was discovered in the LA. basin in 1892 and the city was connected to the national rail network in 1894, the area recorded two different types of unexpected weather patterns. In years of storms and heavy rains, the area reverted to its past as a flood plain, resulting in destruction of man-made structures and economic displacement while changing the course of both the LA and San Gabriel Rivers. In dry years, the existing river system could not supply sufficient water to meet the demand of the resident population as it grew from just over 102,000 people to almost 320,000 people between the 1900 and 1910 US Censuses – and those drought years also brought the first recorded wildfires. The losses from those fires were not significant insofar as there was little settlement or housing near what we would call today the wildland-urban interface.

In an attempt to meet their growing water needs, Angelenos passed a $22.5 million bond issue in 1905 to build an aqueduct to bring water to the city from the Owens River. But it was not long before Los Angeles' growth required more water than the combined resources of the San Gabriel, Los Angeles and Owens rivers could supply. Residents then passed a new $220 million bond issue in 1922 to build another aqueduct, this time to bring water from the Colorado River to Los Angeles. The project was completed in 1941, spanning the 800 miles from the river to the city.

Not surprisingly, then, water resource management practices hundreds of miles away from Los Angeles play an important role in the city's supply today. Prior to 1934, any cattle ranch that bordered public lands could simply turn their cattle out to graze on those lands – and the practice, involving soil and grass recovery from grazing, consumed water that would otherwise have flowed to rivers. This unregulated practice nominally came to an end with the passage of the Taylor Grazing Act that mandated active federal government management of the public lands to generate funds for the federal government. The act required ranchers pursuing federal government permits to graze cattle on public lands to pay fees and maintain the land to protect stream beds and other water sources. However, there was no effective monitoring of compliance with those obligations.

The first significant public coverage of the fact that the users of grazing lands had not been monitored occurred in January of 2006 when the *Arizona Republic* published an article about the purchase of two ranches bordering the Grand Canyon by environmental organizations intent on protecting the Colorado River (McKinnon, 2006). The buyers had uncovered serious degradation of the land's resources, including water resources, by years of unfettered cattle grazing (Trudeau, 2006). They wanted to demonstrate that they could raise cattle and simultaneously serve the original intent of the grazing rights allotments.

Common practices by commercial ranchers on millions of acres of public lands, including overgrazing by numbers of cattle, had led to destruction of stream beds, natural water ponds, and similar environmental features that served to transport groundwater to the Colorado River, thus reducing its flow volume.

Combined, the two ranches, comprising about 1,100 acres, were not large by U.S. standards. Their historic permitted grazing rights, however, were a typical multiple of private lands owned and made up an additional 830,000 acres. Those public lands share a 125-mile-long border with the Grand Canyon National Park through which the Colorado flows.

Local ranchers claimed that cattle grazing was only marginally profitable. Ranchers were being charged $ 1.79 per cow and her calf. Local ranchers believed they could not continue to graze cattle profitably if they had to adhere to the letter of the grazing rights rules.

The two ranches have successfully restored land contours and are returning water to the Colorado River. The cattle herd is smaller than the maximum permitted by the federal land managers and has permitted the operators to reverse the damage done by prior overgrazing. Reclaimed and restored stream beds, natural water ponds and similar environmental features once again transport groundwater to the Colorado River.

One demonstration project, however, does not change the condition in the West where rivers are being starved of the water they need to continue to flow. Simultaneously, while populations grew, the Western US underwent an immense drought for more than three decades.

The last few years in California have seen larger-than-usual rainfall events, appearing to have created what was being called a new "rainy" season in December and January. Those rains refilled reservoirs, so local water conservation efforts were relaxed.

That pattern did not arise in 2024–2025 – the rains did not appear. The reservoir reserves were not adequate to meet the day-to-day needs of the population and fight huge forest fires.

While the L.A. basin is right on the Pacific Ocean, complacency has led to no effort to tap that water resource. To date, no effort has been devoted to building efficient and effective large-scale desalination systems, despite the obvious need for such measures to address risks in the face of weather uncertainty.

The Building Boom in High-Risk Zones

In 2023, *NerdWallet*, an online financial advisory site, published an article asserting that "Americans Flock to Areas With Harshest Climate Change Effects." While the primary thrust of the article was on moving South towards increasingly threatening

heat waves, it also addressed movement towards hills, coasts, and shorelines. Those locations had always had an appeal but became especially attractive as the Covid pandemic stimulated work-from-home employment relationships for the upper middle class since "Everybody wants this idyllic kind of lifestyle; we want to be on the coast or we want to be in these beautiful, serene areas where there's lots of shrubbery and privacy." (Helhoski, 2023).

Historical evidence suggests that Americans with the requisite assets have always wanted to move to aesthetically pleasing locales – and those locales have generally been relatively high risk: seashores, riversides, woodlands and the like. This pattern is in high contrast to what is found in many other parts of the world, in which the poor end up having to settle in locations that are exceptionally vulnerable and thus undesirable.

Environmental change and degradation may also be creating new risks and expanding old ones. Past fires reduce vegetation cover and plant roots that stabilize hillsides, raising the risk of landslides. At the same time, the loss of plant life that absorbs rainfall increases the chance of flash floods. Both these phenomena have already been evident in the disaster experience of fire-prone areas in the United States.

Eliyahu Kamisher (2025) just reported that California seems to be running out of safe places to build, due to the combination of fire risk and the threats from rising seas. But the problem is more widespread. He noted that,

> "In Arizona, groundwater restrictions have halted construction of more than 150,000 housing units, and one developers' association estimates the Phoenix area could run out of buildable land in two to three years. In the Houston area, city and county officials have offered buyouts to homeowners in areas that have proved far more flood-prone than once believed."

In effect, any new land development now is impaired by a greater understanding of what the associated risks to lives and property actually are. (Some projects have been rejected for their effects on evacuation times for existing building occupants in the event of fire or flood events, a consideration that had no standing in law prior to the advent of frequent major natural disasters.) It is increasingly clear that all those risks are rising due to climate change.

V. Impact Expanders

Uncertainty Driven by Climate Change

The lasting effects of any disaster, man-made or otherwise, are shaped by the perceptions of the affected people and institutions about the likelihood of a recurrence of the event. The severity of initial losses plays a central role in shaping responses and

longer-term impacts, Expectations, in turn, tend to be informed by experience. The odds of a repetition of a disastrous event may under normal conditions be informed by the frequency of the event in the past. (That is the basis for descriptions of 50-year, 100-year, or 1000-year floods or fires.)

Risk calculations, which shape disaster responses (and insurance rates), thus tend to be based on past experience. That experience is a poor basis for decision-making if the conditions that shaped past experience have changed. Unless the change in conditions is well understood and the impact of that change on the likelihood of a repeated disaster is measurable, the reliability of risk calculations is undermined by uncertainty.

Residents of affected areas – and the governments that pursue policies to support their well-being – face severe difficulties in planning informed responses to climate-change-driven events. Experience no longer serves well, with increasing weather instability. But what basis exists for decision-making other than experience?

The problem is evident in the behavior of insurance companies that are increasingly withdrawing from some property and casualty markets such as California, Florida and other regions as unanticipated claims mount. To set their premiums for coverage, insurers use statistical models to calculate risk. But climate change generates uncertainty and "uninsurability ensues when uncertainty is so high that statistics become useless in estimating the combined level of losses" (Jarzabkowski, et al., 2023)

Uninsurability will make mortgages increasingly unattainable as the insurance required by lenders becomes more expensive or totally unavailable. Reconstruction in Pacific Palisades, Altadena and the other affected areas of Southern California will be slowed by uncertainty and the resultant difficulty households and businesses have in making – and financing – rebuilding decisions.

Government efforts to spur local economic development have routinely included relief from regulatory measures that raised project costs or slowed construction approvals. Those stimulus provisions frequently weaken safety standards and generate additional risks to households, businesses, and whole communities. This certainly proved to be true in the initial responses to the Altadena and Pacific Palisades disasters.

At the state level, Governor Gavin Newsom suspended California Environmental Quality Act (CEQA) and Coastal Act requirements for rebuilding projects and directed agencies to streamline permitting and building code reviews to accelerate recovery (Newsom, 2025A). The state thus accepted long-term environmental risks as a cost for accelerating short-term redevelopment.

The City of Los Angeles went even further in its efforts to complement the state provisions. Mayor Karen Bass's Emergency Executive Order did not just offer waiver of requirements for demolition permits and further standards relief for construction

but dictated a time limit for regulatory decisions (some as short as two days), virtually guaranteeing less thorough investigations than would normally take place for new construction approvals (Bass, 2025A). The expedited processes undermined any efforts to change land uses or otherwise adapt and respond to the fires and future risks by requiring that property owners rebuild in kind, with the same footprint and land uses in order to get help. This limitation effectively eliminated any possibility of land use planning (which logically must allow for changes in those uses) to address the threats of climate change.

Noting that housing costs have long been a problem in California, some economists assessing the impacts of the fires saw an opportunity in the devastation:

> "Rezoning for higher-density housing, such as duplexes and fourplexes, would allow more intensive use of scarce land, reducing the cost-per-square foot of housing. Housing affordability would improve with more upzoning and construction of more condominiums." (Kahn and Tracy, 2025)

Housing supply increases and lower costs in rebuilt burned-out areas made possible by higher density development would benefit the majority of Angelenos if rezoning and different land uses were encouraged – but that is precisely what Mayor Bass's initial measures, incentivizing rebuilding-in-kind, discouraged.

Government responses to climate change threats, moreover, are themselves sometimes inconsistent and changing, adding another level of uncertainty for businesses and homeowners. For example, after streamlining California reviews of new construction and development in order to speed recovery from the LA. fires, Governor Newsom issued a new order requiring five-foot-wide ember-resistant zones around structures in the highest risk fire zones (Newsom, 2025B). Mayor Bass did the Governor one better, adding a special processing fast-track for households rebuilding all-electric homes in place of destroyed structures. Between that measure and ordering public sector efforts (and expenditures) to minimize flood and landslide risks in and near wildland-urban interfaces, she seemed to prioritize a neighborhood in the city that is the most affluent area in the L.A. basin, Pacific Palisades (Bass, 2025B).

The County of Los Angeles, in which the Altadena neighborhood is located, also committed to facilitating reconstruction by its far less affluent residents. The County waived "requirements for rooftop solar and storage, electrification, and other new efficiency standards" in order to speed rebuilding and, according to the county, save the average resident as much as $30,000. Recognizing their residents' limited liquidity and need for cash, the county also prioritized real estate tax relief and lowered the tax obligations of almost three-quarters of all affected households by June, 2025 (Los Angeles County, 2025).

In all these efforts to accelerate rebuilding, the uncertainty inherent in the experience of climate change tended to be ignored. Short-term gains (political as well as economic) were pursued with little attention paid to the longer-term risk of losses.

Those types of tradeoffs are not unique to California – or, for that matter, the United States. The Labour government has pledged to build 1.5 million new homes in England in the first five years of its term. However, if past construction patterns continue – and there is no indication that any effort has been made to change past practice – then, despite the uncertainties of weather as the world experiences climate change, over 100,000 of those units will be built in what are already the country's highest-risk flood zones (Laville, 2025).

Structural Underinsurance of Properties

More than 16,000 homes and businesses were devastated by the wildfires in Los Angeles County (CalFire 2025A, 2025B). False allegations circulated that State Farm had abandoned its California customers just before the wildfires broke out. In reality, the company, the largest Property and Casualty Insurer in California as of 2023, canceled 72,000 California fire insurance policies over the course of 2024 due to a number of factors (Williard, 2024).

Insurance companies reducing coverage and canceling policies is not a new trend. With the increasing frequency of natural disasters, insurers across the US have had to restructure to keep premiums bearable. In 2023, not only did State Farm stop writing new policies in the state, but Allstate Insurance, the fifth largest home insurer in California also stopped accepting new policies (Mercado, 2023).

What has received particular attention in the public debate over the L.A. fires is their impact on California's state insurer of last resort. The California FAIR Plan (Fair Access to Insurance Requirements) a property insurer of last resort for high risk, mostly residential, properties that individual private insurers either will not cover or for which they charge exceptionally high premiums. The FAIR Plan is a syndicate made up of all of the insurers that write property and casualty insurance in the State of California. It was established by statute in August of 1968, not in response to the recent expansion of fire impacts on the built environment.

The FAIR Plan issues policies to California homeowners who request coverage. The system finances its insurance coverage pool with assessments on all members of the pool in proportion to their market share. Those insurers, in turn, are permitted by the insurance regulator to raise premiums proportionally on all their covered homeowners to reimburse them for 50 % of the assessment when the insurance pool is short less than $1 Billion and for 100 % of the assessment when the statewide deficit in the pool exceeds that $1 Billion.

In Pacific Palisades alone, early estimates showed an insurance loss of almost $6 billion, and the total losses in L.A. are estimated to be between $20 billion for homes and over $50 billion when the consequential damage to the economy is taken into account (Kuttner, 2025). Those losses cannot be covered by FAIR's existing pool so assessments have been issued. In other words, ALL homeowners, not just those in high

fire risk zones, are now sharing in the reimbursements for fire damage, effectively subsidizing the wealthy homeowners in Pacific Palisades, for example, with premiums paid by people who own homes in what may be slums.

California's policy for fire insurance coverage encourages insurers to return to the state and to provide coverage in high-risk areas by permitting them to use catastrophe modeling, rather than relying solely on historic losses, to set rates (California Department of Insurance, 2024). In exchange, companies reentering the market must write and sell policies in risky areas at 85 % of their statewide market share.

These reforms aim to improve private insurance availability, affordability, and adequacy – what Kenneth Klein of California Western School of Law in San Diego refers to as the "three A's" (Gongloff, 2025). While one can expect availability to improve, affordability may fall as insurers are likely to raise rates as authorized by FAIR and through opaque pricing models.

As to adequacy, private insurance policies offer more coverage than the government FAIR plan. Unlike FAIR policies with their "actual cash value", private insurance policies usually provide coverage at "replacement value", which makes a big difference. However, even private insurance is often inadequate due to rising reconstruction costs, especially after major disasters. Klein estimates that 80 % of Americans are underinsured (Gongloff, 2025).

An even more insidious trend in the U.S. is the rise of insurers offering non-admitted policies that provide coverage but are minimally capitalized that enter high-risk markets. They are "non-admitted" in that they do not conform to the capitalization standards that permits them to share in the financial backstop provided by the state insurance regulatory body. As regulated insurers (State Farm, Allstate, Farmers, and others) have been quitting high-risk areas, these new minimally regulated enterprises are filling the gap and offering policies in at premiums below those demanded by FAIR.

These problems go far beyond California as nominal insurers too small to be regulated by their states offer coverage, then go bankrupt when claims explode. Other climate-impact prone states also have problems with underinsurance due to homeowners' unwillingness to buy additional coverage for fires, floods, and hurricanes they do not anticipate. This is a problem that will only get worse with climate change. The hidden losses in house values due to disasters could exceed $1 trillion (Gongloff, 2025) and possibly trigger a financial crisis (Kuttner, 2025).

VI. Conclusion

The devastating wildfires in Los Angeles County have destroyed homes, claimed lives and resulted in unprecedented insured and uninsured losses. Although wildfires in California are now so common that they rarely make headlines anymore, this episode

reminds us of the complexity of causes of wildfire disasters: Climate change, urban sprawl, interplay of ignition sources, organizational failures, social injustices, misallocation of water and grazing rights, building booms in high-risk zones, underinsurance of assets by property owners, and increasing uncertainty and coverage losses in the property and casualty insurance industry. Some of these causes could be easily and immediately addressed, but others cannot be solved by the traditional top-down policies of individual sub-national public bodies. Still others require profound changes in the risk culture – the accepted balance between publicly shared risks and those left to individuals to accept – in the U.S. socioeconomic system as a whole, not just in California.

Due to the resistance of this mix of causal factors to any lasting and socially accepted solution, one can speak of an "organized irresponsibility" – a situation of "seemingly infinite decision-making processes in which it is no longer possible to identify an actor to whom cause and blame can be attributed" (based on Beck, 1995). Such organized irresponsibility has, it seems, increased across societies and polities in today's post-truth era (Galantino, 2022). The political reaction to the Los Angeles fires demonstrates this in an almost unbearable way.

This complex risk environment presents sufficiently insurmountable challenges that several authors from the Fire Research Group at the University of California, Berkeley, have labeled it a "wicked problem" (Kolden, Cobian-Iñiguez and Gollner, 2020; echoed by Smith in a recent LSE blog, 2025). According to Rittel and Webber (1973), wicked problems are characterized by multiple interdependent factors, changing conditions and contested definitions of both the problem and the possible solutions. They are problems for which efforts to solve one aspect tend to only bring to light or create other problems. Basically, these are problems that cannot be solved.

We are a little less pessimistic. We believe that a new balance between public and private goals can be found. That balance would address the root cause of fire (and other "natural") disasters, i.e. economic interests that are not aligned with environmental imperatives. We call for a model of "organized responsibility" in which individuals, businesses and policymakers are collectively committed to reconciling environmental sustainability with economic interests. Only through a turn to accepting collective responsibility and implementing fundamental reforms of the allocation of risks and rewards can the United States move toward a new risk culture that *gradually* and *iteratively* reduces wildfire risk and increases long-term resilience in California and across the nation.

Zusammenfassung

Dieses Papier untersucht die komplexen Ursachen von Waldbränden zu Beginn der „Feuersaison" in Kalifornien und skizziert Strategien zur Bekämpfung der Ursachen und Auswirkungen von Waldbrandkatastrophen in der Region. Ausgehend von der

Erkenntnis, dass Klimafaktoren sowohl als unmittelbare als auch als langfristige Treiber für die Wahrscheinlichkeit und Intensität von Waldbränden in Kalifornien eine Rolle spielen, konzentriert sich dieses Papier speziell auf die nicht-klimatischen Faktoren, die zur Waldbrandkatastrophe in Kalifornien 2024–25 beigetragen haben. Die Analyse basiert auf der Erkenntnis, dass Vulnerabilität, Exposition, Entscheidungsprozesse und andere menschliche Einflüsse diese Waldbrandkatastrophe auf verschiedenen Ebenen verursacht haben: einige speziell für den aktuellen Waldbrand, andere allgemeiner für Waldbrände in Kalifornien und einige wenige im Kern für Waldbrandrisiken im Westen der Vereinigten Staaten. Um die grundlegenden Ursachen zu verstehen, blicken wir zurück auf die Zeit nach dem Bürgerkrieg, als die Wasserrechte erstmals von den USA auf der Grundlage der damals verfügbaren Wassermenge ausgehandelt und zugeteilt wurden.

References

Amalaraj, Perkin. 2025. Staggering image of 100 essential fire trucks idling in a parking lot waiting for repair while Los Angeles apocalyptic fires ravage city killing 24. *Daily Mail*, January 14. https://www.dailymail.co.uk/news/article-14282009/fire-trucks-Los-Angeles-fires.html

Baker, Mike, and Robert Gebeloff. 2025. Los Angeles Had Substandard Hydrants Near Devastating Fire's Starting Point. *The New York Times*, February 4. https://www.nytimes.com/2025/02/04/us/los-angeles-fire-hydrants-substandard.html

Barnes, C., Keeping, T., *et al*. 2025. *Climate change increased the likelihood of wildfire disaster in highly exposed Los Angeles area*. London: World Weather Attribution. 28 January, 2025. https://www.worldweatherattribution.org/wp-content/uploads/WWA-scientific-report-LA-wildfires-1.pdf

Bass, Karen (2025A) *Emergency Executive Order No.1–Return and Rebuild: Expedited Community Rebuilding and Recovery.* City of Los Angeles, Office of the Mayor. January 13, revised March 18. https://mayor.lacity.gov/sites/g/files/wph2066/files/2025-03/EO%201%20REVISED%20-%20Emergency%20Executive%20Order%20-%20Expedited%20Community%20Rebuilding%20and%20Recovery_0.pdf

Bass, Karen (2025B) *Emergency Executive Order No.5–Return and Rebuild: REsilient Rebuilding* City of Los Angeles, Office of the Mayor. March 21. https://mayor.lacity.gov/news/mayor-bass-issues-emergency-executive-order-help-palisades-residents-expedite-rebuilding-more.

Beck, Ulrich. 1995. *Ecological politics in an age of risk*. (Trans. by Amos Weitz) Cambridge: Polity Press

CalFire. 2025A. *Palisades Fire Incident Update*. California Department of Forestry and Fire Protection. January 30. https://www.fire.ca.gov/incidents/2025/1/7/palisades-fire/updates/c83d0751-14b3-4587-9043-27cba51d8b29

CalFire. 2025B. *Eaton Fire Incident Update*. California Department of Forestry and Fire Protection. January 21. https://www.fire.ca.gov/incidents/2025/1/7/eaton-fire/updates/7b2f782e-cc38-4cce-94a0-9409e3ba904b

California Department of Insurance. 2024. *In a California "first". Commissioner Lara announces enforcement of regulation to expand insurance coverage across state*. Press release. December, 2024. https://www.insurance.ca.gov/0400-news/0100-press-releases/2024/release062-2024.cfm

California FAIR Plan Association. 2025. *About the California FAIR Plan*. Authors, https://www.cfpnet.com/about-fair-plan/

Cobian-Iniguez, Jeanette, Michel Gollner, and Crystal Kolden. 2020. *How do we solve the "Wicked Problem"?: the State of Fire Science in California*. Webinar Recording. Berkeley: Univ. of California – Berkeley Fire Research Group. https://frg.berkeley.edu/how-do-we-solve-the-wicked-problem-the-state-of-fire-science-in-california/

Eremita, Brianna, Karin Komshian, and, Sedona, Leza. 2019. Fire-Resilient Housing for Paradise, California. Santa Clara University Civil, Environmental and Sustainable Engineering Senior Theses. 76. Spring. https://scholarcommons.scu.edu/ceng_senior/76

Frisch, Max. 2007. *Man in the Holocene*. (Translated by G. Skelton). Boston: Mariner Books

Galantino, Maria Gazia. 2022. Organised Irresponsibility in the Post-Truth Era: Beck's Legacy in Today's World at Risk. *Italian Sociological Review. XII(85)*: 971-990. http://dx.doi.org/10.13136/isr.v12i8S.598

Galizia, Luiz. 2025. The 2025 Los Angeles Wildfires: A Warning for California's Future. AxaClimate. February. https://climate.axa/publications/the-2025-la-wildfires-a-warning-for-californias-future/

Gibbens, Sarah. 2018. Humans Cause Over 95 Percent of California Wildfires. *National Geographic*. August 10. https://www.nationalgeographic.com/environment/article/news-california-wildfire-arson-human-cause

Gongloff, Mark. 2025. *California Fires Expose a $1 Trillion Hole in US Home Insurance*. Bloomberg Opinion. January 8, 2025. https://www.bloomberg.com/opinion/articles/2025-01-08/california-wildfires-expose-a-458-billion-hole-in-home-insurance

Grand Canyon Trust. 2025. *North Rim Ranches*. https://www.grandcanyontrust.org/north-rim-ranches/

Hamilton, Matt. 2025. LAFD did not alert DWP to more than 1,000 fire hydrants needing repair. *Los Angeles Times*. March 1. https://www.latimes.com/california/story/2025-03-01/lafd-dwp-more-than-1-000-fire-hydrants-needing-repair

Helhoski, A. 2005. Americans Flock to Areas With Harshest Climate Change Effects. *NerdWallet*, 8/11/2023. https://www.nerdwallet.com/article/finance/fast-growing-places-climate-change

Jarzabkowski, Paula, Konstantinos Chalkias, Eugenia Cacciatori, and Rebecca Bednarek (2023) *Disaster Insurance Reimagined: Protection in a Time of Increasing Risk*. Oxford: Oxford University Press. https://global.oup.com/academic/product/disaster-insurance-reimagined-9780192865168?cc=us&lang=en&

Kahn, Mathew E., and Joseph Tracy. 2025. Can We Rebuild Los Angeles? *City Journal*. January 31. https://www.city-journal.org/article/los-angeles-wildfires-destruction-rebuild

Kamisher, Eliyahu. 2025. *California Is Running Out of Safe Places to Build Homes Due to Fires, Rising Seas*. Bloomberg Green. July 2. https://www.bloomberg.com/news/features/2025-07-02/fires-sea-level-rise-limit-places-california-can-build-homes-as-climate-changes?cmpid=BBD070525_GREENDAILY

Kuttner, Robert. 2025. The next financial crisis: Insurance. *The American Prospect*. January 10. https://prospect.org/blogs-and-newsletters/tap/2025-01-10-next-financial-crisis-insurance/

Laville, Sandra. 2025. More than 100,000 homes in England could be built in highest-risk flood zones. *The Guardian*. February 8. https://www.theguardian.com/environment/2025/feb/08/more-than-100000-homes-in-england-could-be-built-in-highest-risk-flood-zones?CMP=Share_iOSApp_Other

Li, Zhiyun and William Yu. 2025. *Economic Impact of the Los Angeles Wildfires*. *UCLA Anderson School of Management***.** March 3, 2025. https://www.anderson.ucla.edu/about/centers/ucla-anderson-forecast/economic-impact-los-angeles-wildfires

Los Angeles County. 2025. *Los Angeles County Previews New Blueprint to Speed Rebuilding and Cut Costs for Residents as Next Phase of Restoration Begins*. Countywide Communications. July 7. https://lacounty.gov/2025/07/07/los-angeles-county-previews-new-blueprint-to-speed-rebuilding-and-cut-costs-for-residents-as-next-phase-of-restoration-begins/

Mercado, Angely. 2023. *Allstate Quietly Paused New Home Insurance Policies in California Months Ago*. June 5. https://gizmodo.com/allstate-pauses-new-home-insurance-policies-in-californ-1850506696

McKinnon, Shaun. 2006. Forced To Let Cattle Graze, Environmentalists Attempt To Restore Land Near Grand Canyon. *Arizona Republic*, January 8. https://www.biologicaldiversity.org/news/media-archive/Forced%20to%20let%20cattle%20graze.pdf

Newsom, Gavin. 2025A. *Executive Order N-18-25*. Executive Department, State of California. January 12. https://www.gov.ca.gov/wp-content/uploads/2025/01/EO-N-4-25-Rebuilding-Final-signed.pdf

Newsom, Gavin. 2025B. *Executive Order N-4-25*. Executive Department, State of California. February 6. https://www.gov.ca.gov/wp-content/uploads/2025/02/2025-2-6.Urban-Conflagration-EO-ATTESTED.pdf

Nicol, Susan. 2025. Dozens of Los Angeles Fire Vehicles Were in the Maintenance Yard During the Wildfires. *Firehouse*. February 6. https://www.firehouse.com/california-fire-storm/video/55266257/dozens-of-los-angeles-fire-vehicles-were-in-the-maintenance-yard-during-the-wildfires

Palumbo, Ross. 2025. *More than 1,300 fire hydrants need maintenance across Los Angeles*. KCAL News. https://www.youtube.com/watch?v=Zbu9JtUKJeA

Roswell, Eric. 2025. Which insurance companies have the most exposure in California? *FoxBusiness*. January 14. https://www.foxbusiness.com/economy/which-insurance-companies-have-most-exposure-california

Sacks, Brianna, Joyce Sohyun Lee, Imogen Piper and Aaron C. Davis. 2025. What caused the Palisades blaze? Visual evidence points to a recent fire nearby. *The Washington Post*, January 12. https://www.washingtonpost.com/weather/2025/01/12/palisades-fire-origin-new-years-eve-fire/

Smith, Thomas. 2025. The causes of Los Angeles' wildfires are complex and may have equally difficult and complicated solutions. *LSE blog*. January 27. https://blogs.lse.ac.uk/usappblog/2025/01/27/the-causes-of-los-angeles-wildfires-are-complex-and-may-have-equally-difficult-and-complicated-solutions/

Tchekmedyian, Alene. 2025. Damaged engines didn't affect Palisades firefight. But they point to a larger problem. *Los Angeles Times*, June 1. https://www.latimes.com/california/story/2025-06-01/damaged-engines-didnt-affect-palisades-firefight-but-they-point-to-a-larger-problem

Trudeau, Joseph M. 2006. *An Environmental History of the Kane and Two Miles Ranches in Arizona*. Report to the Grand Canyon Trust. www.grandcanyontrust.org/wp-content/uploads/2024/Environmental_History_Kane_and_Two_Mile_Ranches.pd

Warner, S.B. 1978. Streetcar Suburbs: The Process of Growth in Boston, 1870–1900. Second Edition. Cambridge, MA: Harvard University Press

Western Fire Chiefs Association (WFCA). 2025. *Deadliest Wildfires in California History*. Authors. January 28, 2025. https://wfca.com/wildfire-articles/deadliest-wildfires-in-california-history/#pp-toc-6x9tjk18rl5u-anchor-0

Willard, Jack. 2024. State Farm to pull out of 72,000 California insurance policies. *ReInsurance News*. March 21. https://www.reinsurancene.ws/state-farm-to-pull-out-of-72000-california-insurance-policies/

Wisner, Ben, JC Gaillard, Ilan Kelman. 2011, Framing Disaster. Chapter 3 in Wisner, Ben, JC Gaillard, Ilan Kelman, The *Routledge Handbook of Hazards and Disaster Risk Reduction*. London, Routledge. https://www.routledgehandbooks.com/doi/10.4324/9780203844236.ch3