



CROWE Graduate Scholar Series #2

Housing Markets Under Wildfire Risk: The Roles of Risk Information and Insurance Regulation*

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Executive Summary

- We study the impact of wildfire risk disclosure on housing market and home financing outcomes in California.
- We find that a wildfire risk disclosure policy decreases home prices and induces a shift away from mortgage-financed homebuyers towards cash buyers.
- Our results are consistent with a model in which homebuyers have noisy and biased beliefs about wildfire risk, where the risk disclosure acts as an information signal that causes buyers to update their beliefs about wildfire risk.
- Our results also suggest that some of the behavior we document is driven by the interaction between California's unraveling homeowners insurance market and the requirement that mortgage-financed buyers obtain insurance in order to close on a purchase.
- We propose reforms to the California homeowners insurance market that would improve the functioning of the market and allow households to make better, more risk-informed decisions about where to live.

1 Introduction

Housing markets function best when buyers can make informed decisions. As climate risks become more salient, policymakers have increasingly turned to disclosure policies that provide households with better information about environmental hazards before they purchase a home. Whether additional information improves housing market outcomes, however, depends not only on how buyers update their beliefs about risk, but also on the institutions that shape their purchasing decisions. In this paper, we study how information about wildfire risk changes home buying decisions in California and show that its effects are mediated by the state's homeowners insurance market.

California's wildfire risk has grown substantially over the past several decades. Longer fire seasons, rising temperatures, prolonged drought, and expanding development in the wildland-urban interface have increased both the frequency of destructive fires and the value of property exposed to wildfire risk. As losses have mounted, homeowners insurance has become an increasingly important component of the housing market.

Unlike flood insurance, which is almost exclusively purchased through the National Flood Insurance Program, wildfire risk is covered through standard homeowners insurance policies. Mortgage lenders require borrowers to maintain homeowners insurance throughout the life of the loan, making insurance a prerequisite for obtaining mortgage financing. Without acceptable insurance coverage, most homebuyers cannot close on a mortgage.

California's homeowners insurance market has struggled to adapt to rapidly increasing wildfire losses. Proposition 103 substantially limits insurers' ability to adjust premiums to reflect changing risks, slowing the implementation of rate increases. Facing rising losses and constrained pricing, several major insurers have reduced their participation in California or stopped writing new policies altogether in many parts of the state. As private insurers have withdrawn, homeowners have increasingly turned to the California FAIR Plan, the state's insurer of last resort. Although the FAIR Plan provides an important safety net, it generally offers more limited coverage at higher cost than traditional homeowners insurance.

These insurance market conditions have important implications for housing markets because they affect different buyers in different ways. Mortgage-financed buyers must obtain insurance before closing and provide proof of coverage to their lender. If insurance cannot be secured, the purchase may fall through altogether. All-cash buyers face no comparable requirement. They may purchase the property before arranging insurance, continue shopping for coverage after closing, choose lower levels of coverage, or even remain uninsured. Our analysis of data from the American Housing Survey supports this conclusion – we find that homeowners without mortgages are uninsured at rates 5-10 times as high as

homeowners who hold mortgages. As insurance becomes more difficult to obtain, these institutional differences increasingly determine who is able to purchase homes in wildfire-prone communities.

Recognizing that buyers often entered purchase contracts with limited knowledge of wildfire hazards, California expanded its Natural Hazard Disclosure requirements in 2021. The revised disclosure form requires sellers to inform buyers when a property lies within a designated Fire Hazard Severity Zone and warns that the property's hazards may limit the buyer's ability to obtain homeowners insurance. Buyers receive this information after an offer has been accepted and have three days to rescind the purchase if they choose. While the disclosure does not provide property-specific insurance premiums or guarantee whether coverage will be available, it alerts buyers that wildfire risk may have important financial consequences beyond the physical risk of fire itself.

The disclosure policy therefore provides an opportunity to examine how better information affects household decision-making. Because the policy changes what buyers know—but not the underlying wildfire hazard itself—it allows us to study how climate risk information influences housing markets in the presence of an increasingly constrained homeowners insurance market.

2 Empirical Work

We study the effects of California's wildfire information disclosure policy on housing markets in California in a pair of related papers. For each paper, we will describe the main research questions, the data and empirical methods we use to answer that question, and discuss the results.

2.1 Data

Across both projects studying the risk disclosure policy, we use similar data sources to study the effects of the risk disclosure policy on housing market outcomes.

First, we assemble several sources of information about wildfire risk in California. Figure 1 maps out three important measures that we use.

Panel (a) maps historical wildfire perimeters from CAL FIRE, identifying observed wildfire activity. Panel (b) shows CAL FIRE-designated Fire Hazard Severity Zones (FHSZ), which define disclosure policy boundaries. Panel (c) displays the U.S. Forest Service's Wildfire Hazard Potential (WHP), a continuous measure of modeled wildfire risk based on fuels, weather, and suppression difficulty. Each of these sources helps to paint a picture of the geographic dispersion of wildfire risk in the state of California.

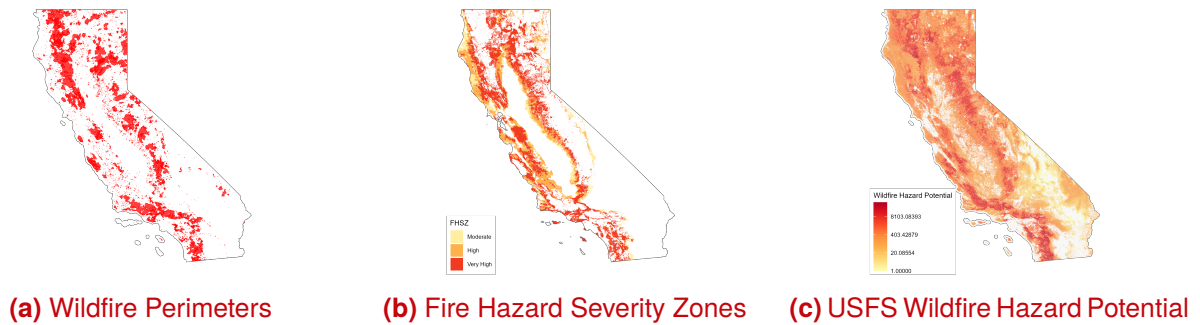


Figure 1: Wildfire Exposure and Risk in California

In addition to the data on fire risk, we also rely on data from CoreLogic that covers the universe of housing transactions in California from 2017-2024. We focus on transactions of single-family homes, where we observe the exact location of the house, the sale price, a large inventory of housing characteristics (such as square footage, acreage, number of bedrooms, etc), and some buyer characteristics, including whether or not the purchase was financed with a mortgage and whether the home is used as a primary residence or for another non-primary purchase (such as a vacation home or rental property). Overall, we have almost 4 million home transaction in our primary dataset. Table 1 shows the distribution of buyer types across financing sources and intended usage.

Type	Financing	Purchase Type	Frequency
0	Mortgage	Primary	0.56
1	Mortgage	Non-Primary	0.20
2	Cash	Primary	0.08
3	Cash	Non-Primary	0.17
<i>N</i>		3,916,856	

Table 1: Buyer Types

2.2 Boundary Analysis

Our first paper, Bass and Fogarty (2025) studies the effect of the risk information policy by zooming in on regulatory boundaries created by the policy. On one side of these boundaries (which we will refer to as the disclosed side) home sellers are required to check a box on the Natural Hazard Disclosure form informing buyers that the home is in a high-risk wildfire area. On the other side (which we will call the undisclosed side) homeowners do not have to check the box on the disclosure form. Figure 2 reproduces the newly added section of the Natural Hazard Disclosure Form.

In addition to the wildfire risk category, the form also highlights the importance of fire management responsibility: in state responsibility areas (SRAs), CalFIRE is in charge of

A HIGH or VERY HIGH FIRE HAZARD SEVERITY ZONE (FHSZ) as identified by the Director of Forestry and Fire Protection pursuant to Section 51178 of the Government Code or Article 9 (commencing with Section 4201) of Chapter 1 of Part 2 of Division 4 of the Public Resources Code. The owner of this property is subject to the maintenance requirements of Section 51182 of the Government Code.
Yes ____ No ____ High FHSZ in a state responsibility area ____ Very High FHSZ in a state responsibility area ____ Very High FHSZ in a local responsibility area ____
A WILDLAND AREA THAT MAY CONTAIN SUBSTANTIAL FOREST FIRE RISKS AND HAZARDS pursuant to Section 4125 of the Public Resources Code. The owner of this property is subject to the maintenance requirements of Section 4291 of the Public Resources Code. Additionally, it is not the state's responsibility to provide fire protection services to any building or structure located within the wildlands unless the Department of Forestry and Fire Protection has entered into a cooperative agreement with a local agency for those purposes pursuant to Section 4142 of the Public Resources Code.
Yes ____ No ____
THESE HAZARDS MAY LIMIT YOUR ABILITY TO DEVELOP THE REAL PROPERTY, TO OBTAIN INSURANCE, OR TO RECEIVE ASSISTANCE AFTER A DISASTER.

Figure 2: Natural Hazard Disclosure Form

wildfire management, and prioritizes protecting wildland areas over individual structures, while in local responsibility areas, local fire agencies typically prioritize protecting individual structures. This institutional difference motivates our decision to study the effects of the policy separately by fire management status in addition to examining the overall impact of the policy.

To study the impact of the policy, we compare outcomes for homes that sell within a narrow bandwidth of the regulatory boundary that determines the disclosure status on the form above, both before and after the disclosure policy goes into effect. These two comparisons (across the regulatory boundary, as well as before and after the policy) allow us to control for persistent difference between the disclosed and undisclosed sides of the boundary, as well as for time trends that affect the California real estate market as a whole, isolating the direct impact of the disclosure policy on various real estate market and home financing outcomes.

The first outcome we study is home sales prices. Columns 1 and 2 of Table 2 show the impacts of the policy on sales prices for all boundaries in our sample (Column 1) and split by fire management status (Column 2). Overall, we find that wildfire risk disclosure decreased home prices by 4% compared to the undisclosed areas. When we split by fire management status, the results are much stronger in the state-managed fire responsibility zones: prices fall by 14.3%, compared to a decrease of 3.2% in the local responsibility areas.

Next, we study the effect of the policy on the financing decisions of homebuyers. Here, the outcome is the share of homes that are purchased in cash, rather than financed with a mortgage. We find no impact of the policy overall on cash purchases, but this masks a

large difference when we split by fire management status. In the state-managed fire areas, the share of cash purchases increases by 14 percentage points, a 63% increase from the baseline of 22 percentage points.

	Log Prices (1) Baseline	Log Prices (2) Fire Mgmt	Cash Purchases (3) Baseline	Cash Purchases (4) Fire Mgmt
Baseline	-0.040*** (0.013)		-0.005 (0.011)	
SRA		-0.147* (0.076)		0.140*** (0.050)
LRA		-0.032** (0.013)		-0.017 (0.011)
Obs	50,340	50,340	50,340	50,340
Baseline Mean	13.259	13.259	0.220	0.220

Table 2: Effects on Transactions

We next examine mechanisms that drive sensitivity to the disclosure policy, with a particular focus on California’s increasingly dysfunctional insurance markets. We use the share of homeowners policies underwritten by the FAIR Plan, California’s state insurer of last resort, as a proxy measure of insurance market tightness.[†] Figure 3 shows the growth in FAIR plan reliance for California zip codes between 2018 and 2020.

When we conduct a similar exercise, but allow the effect of the policy to vary with FAIR plan exposure, we find that the cash purchase effects are driven by areas with high exposure to the FAIR plan. Moving from a FAIR exposure of 0 to 25 percent, the effect of disclosure on cash purchases increases from 12 to 23 percentage points. This suggests that households financing their home purchase with a mortgage, who are required to obtain homeowners insurance as a part of the bank’s underwriting requirements, are moving away from these particularly high-risk areas, and that cash buyers, who can delay (or completely forgo) obtaining homeowners insurance, are moving in instead.

2.3 Neighborhood Choice Model

In our second paper that studies the impact of the policy, Bass and Fogarty (2026), we zoom out from the narrow question of the impact of the disclosure policy on prices and financing decisions to study what features of household decision-making could be driving the results we found.

To do this, we adapt a neighborhood choice model, a workhorse tool from urban economics used to study the location decisions of households, and adapt it to our setting by including

[†]Households typically go on the FAIR plan if they are unable to find coverage on the private market. FAIR plan coverage is less generous and typically more expensive than private market insurance, when it is available.

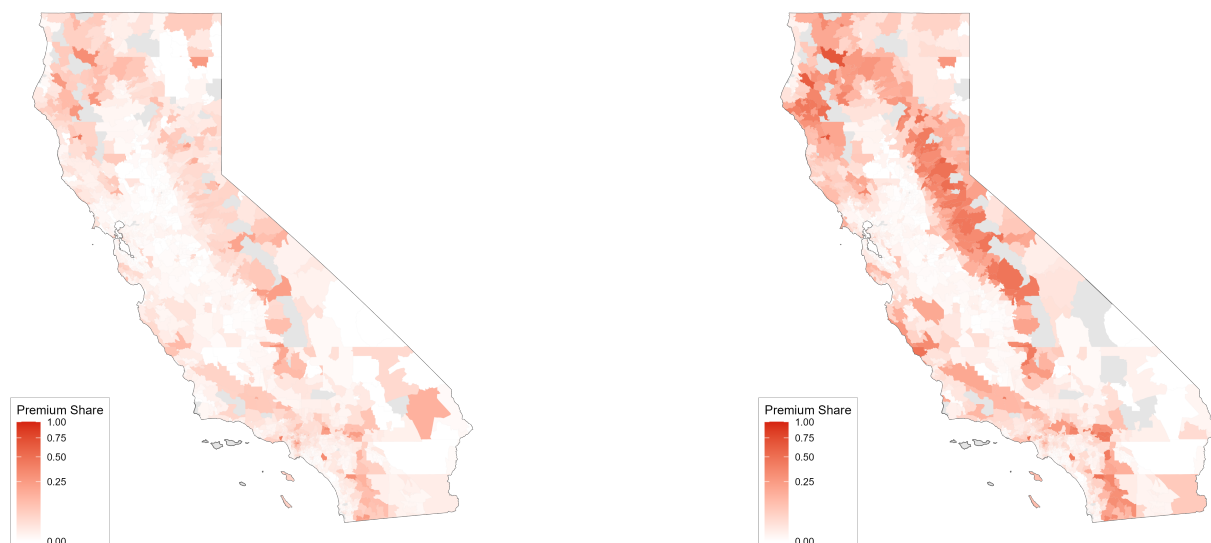


Figure 3: FAIR Plan Reliance, 2018 and 2020

household beliefs about wildfire risk as an additional factor that influences households' location decisions. In the baseline model, households care about both home prices and neighborhood amenities (things like restaurants, quality local schools, public parks), and trade these factors off when deciding which neighborhood to move to.

We adapt the baseline model by adding beliefs about wildfire risk as an additional factor that households weigh when making the decision about where to buy a house. Before the risk disclosure policy comes into effect, households beliefs about wildfire risk in a neighborhood are noisy and potentially downward-biased. After the policy is introduced, one of two things happens: if the neighborhood is subject to the disclosure policy, households update their beliefs in a positive direction, and if the neighborhood is not subject to the disclosure requirement they update their belief in a downward direction. This divergence in beliefs across the disclosed and undisclosed neighborhoods generates the sorting patterns and price effects we found in our first study.

We find that different groups of buyers have distinct preferences for wildfire risk and home prices. In particular, we find that mortgage-financed buyers of primary homes are the most risk-sensitive group; when the disclosure policy comes into effect and newly-disclosed neighborhoods now appear riskier, this group shifts away from disclosed neighborhoods towards undisclosed neighborhoods. This causes a knock-on effect on neighborhood prices; because mortgaged buyers make up a majority of the market, demand for these neighborhoods declines, and prices fall in order for the market to clear. Finally, other groups

that are less risk sensitive and more price sensitive, such as cash buyers and buyers of non-primary residences, then sort in to take advantage of the lower prices.

3 Policy Implications

Our findings suggest that providing households with better information about wildfire risk improves the functioning of housing markets. When buyers learn that a home faces elevated wildfire risk and potential insurance constraints, they adjust their purchasing decisions accordingly. Home prices fall to reflect the newly salient risks, and buyers who are unable or unwilling to bear those risks exit higher-risk markets. In this sense, California's wildfire disclosure policy appears to have achieved its intended objective: helping households make more informed decisions about a major financial investment.

The broader lesson, however, is that information alone cannot produce efficient market outcomes when insurance markets are unable to function effectively. In a well-functioning insurance market, buyers learn about a property's risk, insurers price that risk, households decide whether the costs are worth bearing, and homes are allocated to buyers who value them most. California's homeowners insurance market increasingly departs from this ideal. Rate regulation limits insurers' ability to price rapidly changing wildfire risks, regulatory approval delays slow premium adjustments, and many insurers have reduced their participation in the market altogether. As insurance availability contracts, mortgage-financed buyers—who must secure homeowners insurance before closing—face binding financing constraints, while all-cash buyers do not.

Previous work has found that lower housing prices in flood-prone areas often attract lower-income and minority households, suggesting that price sensitivity dominates risk sensitivity. In California's wildfire market, we find the opposite pattern for mortgage-financed buyers. Information about wildfire risk appears to discourage many mortgage-dependent households from purchasing high-risk homes despite lower prices. The key institutional difference is that homeowners insurance requirements are strictly enforced by mortgage lenders, whereas flood insurance requirements have historically been enforced less consistently. As a result, wildfire insurance constraints directly limit access to mortgage credit, making insurance availability an important determinant of who is able to participate in the housing market.

These findings suggest several policy reforms.

Restore risk-based pricing. Insurance markets function best when premiums reflect expected losses. California's current regulatory framework, including automatic public hearings for large rate increases, makes it difficult for insurers to adjust prices as wildfire risk

evolves. Allowing insurers to price risk more accurately would encourage greater participation in the private market, reduce reliance on the FAIR Plan, and improve insurance availability for homeowners.

Allow insurers to incorporate forward-looking measures of climate risk. Wildfire risk is changing rapidly as climate conditions evolve. Premiums based solely on historical losses may substantially understate future risk, discouraging insurers from writing new policies in high-risk areas. Incorporating forward-looking catastrophe models would allow prices to better reflect expected future losses while providing stronger signals about where mitigation investments are most valuable.

Improve insurance market transparency. Buyers currently receive only a general warning that wildfire hazards may affect their ability to obtain homeowners insurance, and they often do not learn the likely cost or availability of coverage until after an offer has been accepted. California's Department of Insurance provides a public premium comparison tool, but it offers only coarse city-and-county-level estimates, caps coverage amounts at \$1 million, and cannot account for the property-specific characteristics that drive wildfire underwriting. Expanding this tool to provide more granular, parcel-level estimates of expected premiums and coverage availability would allow households to make better-informed decisions earlier in the home-buying process, reduce failed transactions, and improve the efficiency of housing markets.

Strengthen incentives for wildfire mitigation. California has recently required insurers to incorporate property-level and community-level wildfire mitigation efforts into their underwriting and pricing decisions. This is an important step toward rewarding risk reduction. However, homeowners still have little information about the financial benefits of mitigation before making costly investments. A homeowner considering a new roof, ember-resistant vents, or defensible space rarely knows how much those improvements will reduce annual premiums, making it difficult to evaluate whether the investment is worthwhile. Providing greater transparency about how specific mitigation measures affect insurance premiums would strengthen incentives for risk reduction, encourage more cost-effective adaptation, and allow homeowners to make informed investment decisions before undertaking expensive mitigation projects.

Taken together, these reforms would complement California's wildfire disclosure policy. Better information allows housing markets to recognize climate risk, while well-functioning insurance markets allow households to respond to that information without unnecessarily restricting access to homeownership. Both are essential components of a housing market that can adapt efficiently to a changing climate.

4 Conclusion

California's wildfire insurance crisis offers an early look at a challenge that many states are likely to face as climate risks continue to grow. Wildfires are not unique in placing pressure on insurance markets. Hurricanes, severe convective storms, hail, tornadoes, and other climate-related hazards are increasing insured losses across the United States, prompting insurers to reassess where and how they provide coverage. As these pressures expand beyond California, policymakers will increasingly confront the same fundamental question: how can housing markets adapt to changing climate risks while preserving broad access to homeownership?

Our findings suggest that information is an important part of the solution, but it is not sufficient on its own. Transparent disclosure allows buyers to better understand climate risk and incorporate that information into a major financial decision. At the same time, information is most valuable when insurance markets are able to price risk and provide coverage efficiently. When insurance regulation prevents premiums from reflecting underlying risk or discourages insurer participation, climate risk information can unintentionally shift homeownership toward households with greater liquidity while limiting access for mortgage-dependent buyers.

The broader policy challenge is therefore not simply whether states should disclose climate risks, but how they should design institutions that allow households to respond to those risks. Balancing transparency, insurance availability, affordability, and market incentives will become increasingly important as climate risks evolve. Well-functioning insurance markets provide price signals that encourage adaptation, support investment in risk reduction, and allocate risk to those best able to bear it. Disclosure policies complement these markets by ensuring that buyers understand the risks they are taking on before committing to a purchase.

California's experience demonstrates both the promise and the limitations of climate risk disclosure. Better information can improve housing market decisions, but lasting resilience will require insurance markets that can accurately price risk, reward mitigation, and maintain broad access to coverage. As other states confront growing climate-related insurance challenges, these lessons will become increasingly relevant for designing policies that promote both efficient markets and resilient communities.

References

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