

Economics, Wildfire Risk, and Insurance: Washington State Wildfire and Resiliency Standards Work Group

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My background

- ▶ Assistant Professor, Department of Applied Economics, Oregon State University.
- ▶ Research:
 - ▶ Climate risk in homeowners insurance markets.
 - ▶ Wildfire and climate impacts on public lands.
 - ▶ Wildfire smoke.
 - ▶ Fire ecology and weather.
- ▶ PhD from University of California, Santa Barbara.
- ▶ Personal: Previously lived in Washington for 23 years.

What is a “healthy” insurance market?



- ▶ Risk pooling and diversification.
- ▶ Competition among insurers.
- ▶ Consumer access and affordability.
- ▶ Solvency.
- ▶ Prices that convey accurate risk signals.
- ▶ Transparency and oversight.

Mounting concerns about health of homeowners insurance markets

CLIMATE

How climate change could cause a home insurance meltdown

July 22, 2023 · 6:00 AM ET

By [Michael Copley](#), [Rebecca Hersher](#), [Nathan Rott](#)

The New York Times

Why California and Florida Have Become Almost Uninsurable

July 21, 2023

Insurance markets are central to wildfire challenge

- ▶ Losses from catastrophic disasters escalating.
- ▶ Property insurance markets reduce exposure to wildfire risk and help households recover from disasters.
- ▶ Firms need to set prices that accurately reflect wildfire risks.



Wildfire damage in Los Angeles. Source: Agence France-Presse/Getty Images.

Climate change challenges for property insurers

1. Infrequent and catastrophic events.
 - ▶ More difficult to predict natural disaster losses than in the health and auto sector.
2. Correlated risks.
 - ▶ Costly reserve or reinsurance requirements to meet solvency standards (“risk load”).
3. Regulation.
 - ▶ Limits on price increases.
 - ▶ Limits on forward-looking pricing.
4. Asymmetric and incomplete information.
 - ▶ Property owners uninformed about their own risk.
 - ▶ Risk rating varies between insurers.

Four questions about wildfire risk and homeowners insurance

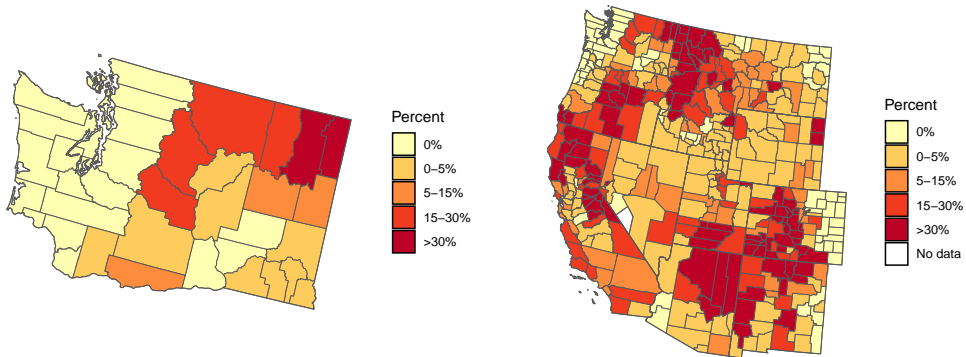


1. Where is wildfire risk and insurance stress high in Washington?
2. How do insurance regulation, risk pricing, and availability vary across states?
3. What are the benefits and costs of defensible space and home hardening?
4. Are consumers adequately insured?

Question 1: Where is wildfire risk and insurance stress high in Washington?

Wildfire exposure is highest in Eastern Washington

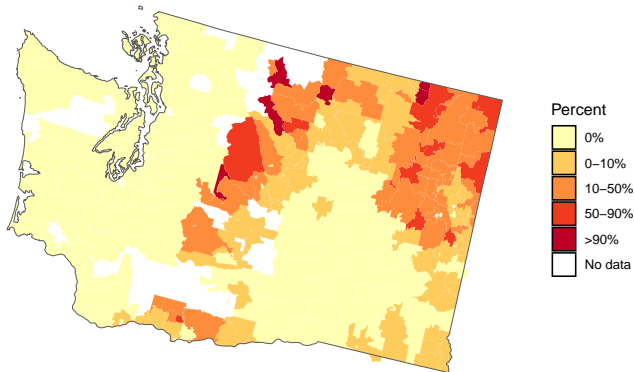
Percent of homes with “high” or “very high” wildfire risk, by county:



Source: CoreLogic.

Some zip codes have high risk concentration

Percent of homes with “high” or “very high” wildfire risk, by zip code:



Source: CoreLogic.

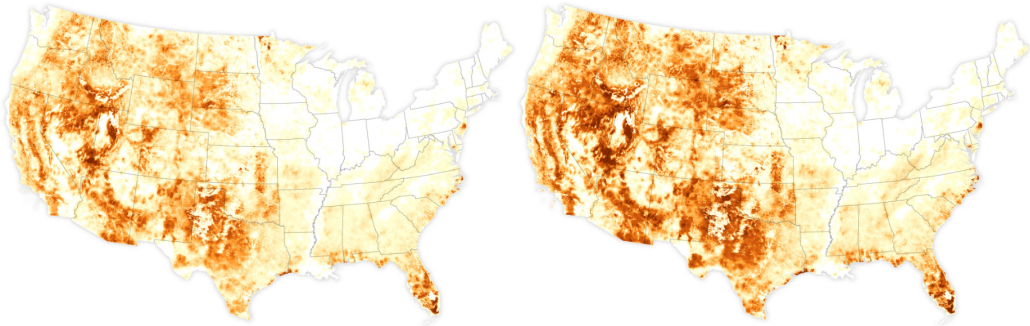
Strongest wildfire risk growth expected in Eastern Washington

Growing Wildfire Risk



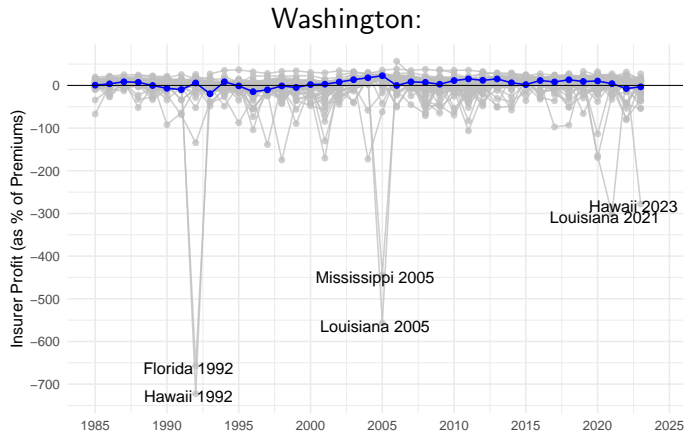
The estimated likelihood of wildfire **today**.

And **in 30 years**, with warming.



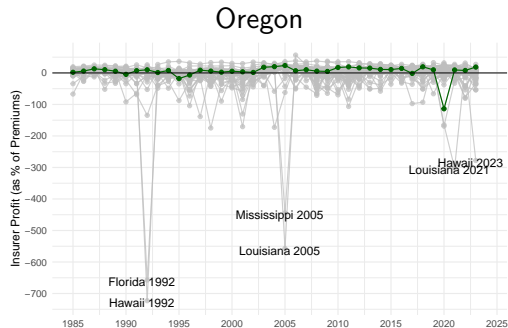
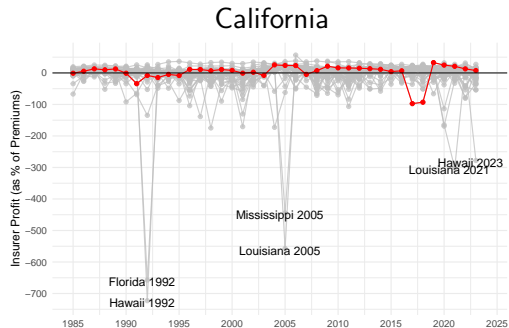
Source: New York Times, First Street Foundation.

Homeowners insurance profit has been modest in Washington



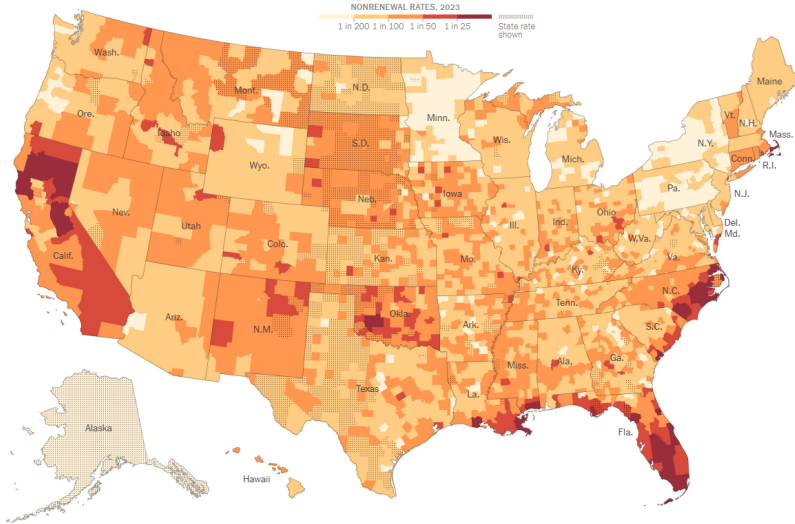
Data represent profit on insurance transactions, which include underwriting profit, investment gains, and federal taxes. Washington is in blue; all other states in gray. Source: NAIC.

Catastrophic events in California and Oregon erased years of profits



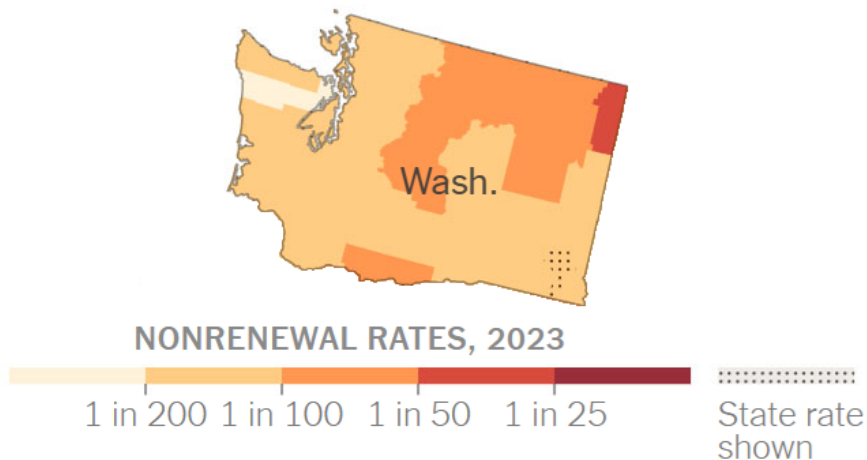
Data represent profit on insurance transactions, which include underwriting profit, investment gains, and federal taxes. California is in red; Oregon is in green; all other states in gray. Source: NAIC.

Insurance non-renewals a major issue in many states



Source: New York Times, U.S. Senate Budget Committee.

Washington insurance non-renewals concentrated in high risk areas

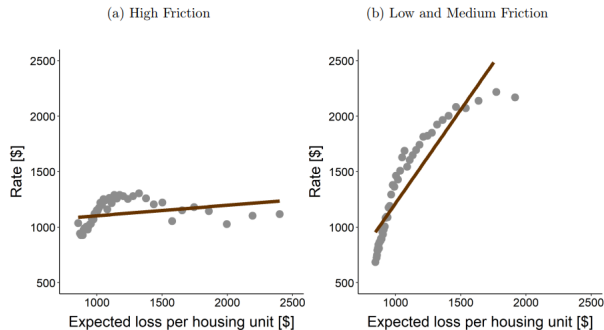


Source: New York Times, U.S. Senate Budget Committee.

Question 2: How do regulation, risk pricing, and availability vary across states?

Risk pricing is a result of each state's regulation

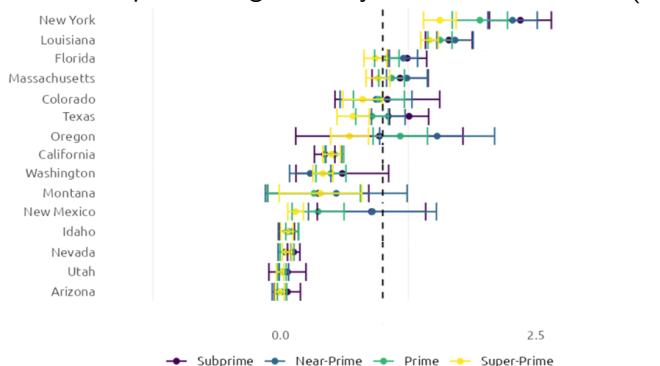
Premium to risk relationship by regulatory friction (2019):



- ▶ State regulations on insurance premiums: CAT model disclosure requirements, claims history restrictions, household characteristics, length of review process.
- ▶ Insurers cross-subsidize between states: Higher rates in lax states to compensate for lower rates in restrictive states (Oh et al. 2025).
- ▶ Cross-state distortions increase insurer exits from highly-regulated states (Oh et al. 2025).

Disaster risk underrepresented in Washington insurance premiums

Disaster risk passthrough rate by state and credit bin (2023):

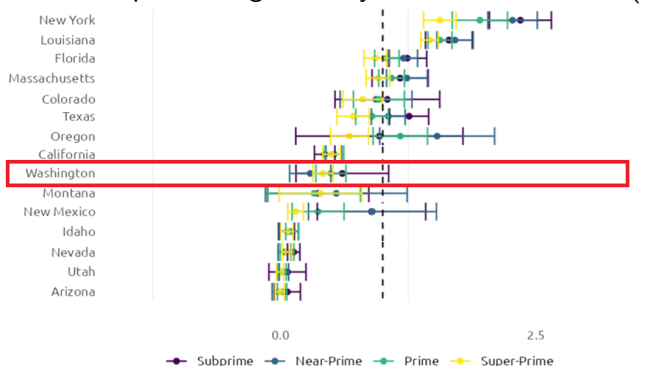


- ▶ The passthrough of disaster risk varies by state (Blonz et al. 2024).
- ▶ Washington: Less than one-to-one passthrough.

Image: Blonz et al. (2024).

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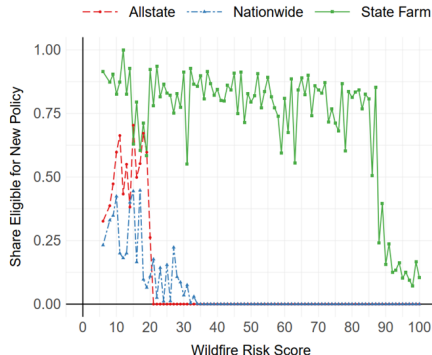


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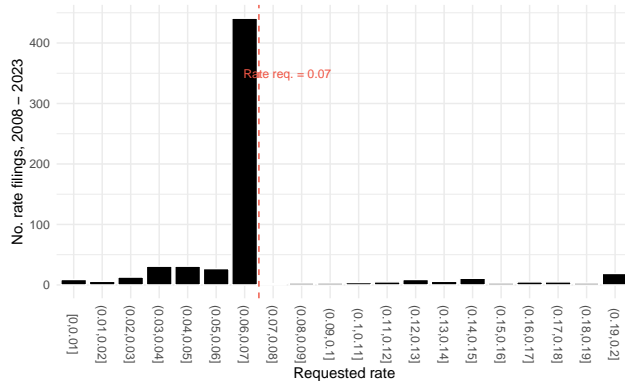
Differences in risk pricing between insurers affects affordability, availability

California new policy eligibility by risk score (2021):



- ▶ Insurers vary in risk pricing granularity: zip code, categorical risk score, 1 km grid.
- ▶ Firms w/ granular pricing “cream skim” low risk homes in high hazard areas (Boomhower et al. 2025).
- ▶ To compensate, firms with less granular risk rating charge higher prices in high risk segments, or pull out (Boomhower et al. 2025).

California has had some of the most severe insurance issues



- ▶ Average rate increases larger than 7% can trigger public hearings.
- ▶ Restrictions on CAT model use for overall rates.

Image: Boomhower et al. (2025).

California Sustainable Insurance Strategy reforms (2025)



- ▶ Carrot: Insurers can use catastrophe modeling and price reinsurance in rate filings.
- ▶ Stick: Insurers must write at least 85% of statewide market share in wildfire distressed areas.
- ▶ Development of public catastrophe model led by Cal Poly Humboldt, similar to FL public hurricane model.
- ▶ Approval of private Verisk catastrophe model; others in queue include Karen Clark & Company, CoreLogic, Moody's RMS.

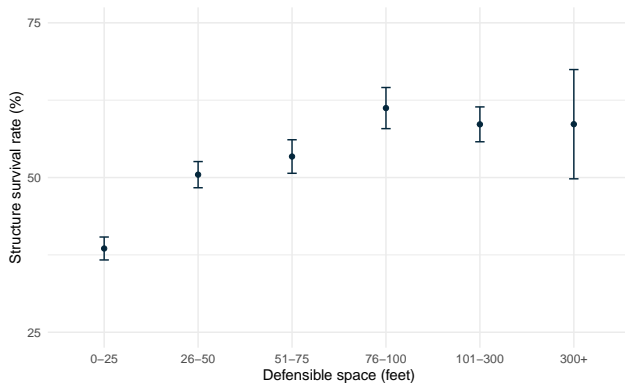
Policies for pricing and availability



- ▶ Policies to improve insurer information (e.g. public risk model, lower CAT model restrictions) are predicted to lower average prices and increase insurer participation (Boomhower et al. 2025).
- ▶ Requirements to disclose CAT model details can act as barrier to usage (Oh et al. 2025).
- ▶ More granular risk pricing sends more accurate signals, but burdens of higher risk properties could fall on socially disadvantaged communities.
- ▶ Multiple models may reduce uncertainty: CAT models correlate in rank order but not in absolute levels (Wylie et al. 2025). For certain perils, insurers in CA average results from multiple models.

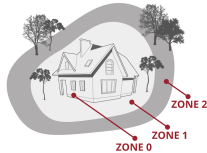
Question 3: What are the benefits and costs of defensible space and home hardening?

Defensible space and home hardening empirically reduce home destruction



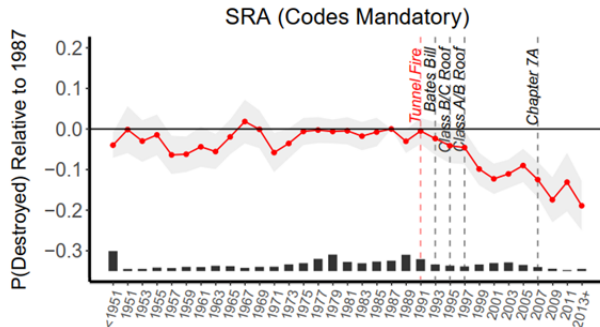
- ▶ Defensible space increases structure survival probability (Syphard et al. 2014).
- ▶ Zone 0 (0-5 ft) most critical, but protection benefits rise over 15-66 ft interval (Syphard and Keeley 2019).
- ▶ Enclosed eaves, vent screens, and multi-pane windows explain structure survival more than defensible space (Syphard and Keeley 2019).

Some California defensible space policies



- ▶ Insurer discounts: California “Safer from Wildfires” framework requires insurance companies to give discounts for home hardening and defensible space.
- ▶ Mandatory requirements: Some counties (e.g. San Diego) require Zone 1 (50 ft) defensible space.
- ▶ Enforcement: Over 2010 to 2018, Cal Fire inspected more than 128,000 properties but rarely issued citations for defensible space (Emerson Smith 2019).
- ▶ Cal Fire Community Wildfire Preparedness and Mitigation Division, Wildfire Prevention Grants Program: Local projects focusing on vegetation management, defensible space, home hardening.

California building codes have made more resilient houses



- ▶ California mandatory wildfire building codes for new houses in 1991 and 2008 in State Responsibility Areas – roofs, eaves, siding, vents, windows, decks, defensible space.
- ▶ Homes subject to building codes less likely to be destroyed (Baylis and Boomhower 2025).
- ▶ Wildfire-resilient building codes reduce house-to-house fire spread (Baylis and Boomhower 2025).
- ▶ Strong positive economic benefits for new home construction, but retrofitting existing homes only economic in extreme wildfire hazard areas (Baylis and Boomhower 2025).

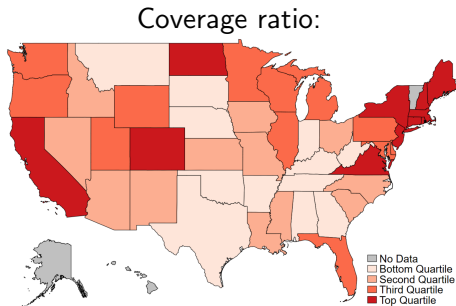
Building codes in the Northwest



- ▶ Oregon mandated wildfire resilient building codes in 2021 (SB 762) for new construction – implementation ongoing.
- ▶ Oregon wildfire hazard map repealed in June 2025 due to concerns about insurance premiums, policy availability, and model accuracy.
- ▶ Washington wildland urban interface (WUI) building codes (SB 6120) and hazard maps ongoing.

Question 4: Are consumers adequately insured?

Homeowners generally do not hold enough insurance



- ▶ Homeowners are underinsured relative to replacement cost (Cookson et al. 2025, Sastry et al. 2025).
- ▶ Underinsurance strongest amongst financially vulnerable households (Sastry et al. 2025).
- ▶ About 40 percent of destroyed homes in California wildfires over 2012 to 2020 received insurance settlements lower than replacement cost (Biswas et al. 2023).
- ▶ Underinsured homeowners are less likely to rebuild, more likely to relocate after a disaster (Biswas et al. 2023, Cookson et al. 2025, Ge et al. 2025).

Underinsurance driven by lack of consumer knowledge



- ▶ Insurers have differential ability to predict replacement cost of homes due to different models (Cookson et al. 2025, Klein 2018).
- ▶ Homeowners shop on premiums without paying attention to more complex coverage features, e.g. extended replacement (Cookson et al. 2025).
- ▶ Homeowners rely on insurer estimates to set coverage (Cookson et al. 2025, Klein 2025).
- ▶ Insurers with more policy holders and more years of experience write higher coverage limits (Cookson et al. 2025).

Some policies addressing transparency and coverage adequacy

California Department of Insurance
Insurance questions? Call 800-927-4357

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Policy Comparison

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[PRINT](#) [+ ADD POLICY](#)

Company	State Farm General Insurance Company	Allstate Insurance Company	Nationwide Insurance Company Of America
Policy	Homeowners Policy	Allstate Deluxe Homeowners Policy	Homeowner 3 Specialty Form

+ TYPE OF COVERAGE

- REQUIRED MINIMUM LIMITS OF COVERAGE

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This section indicates if the company has a specific minimum value on the dwelling structure or the personal property before it is willing to offer coverage.

Dwelling (A)	No Minimum	100% of Estimated Replacement Cost	No Minimum
Other Structures (B)	10% of Coverage A Limit *	10% of Coverage A Limit	10% of Coverage A Limit *
Personal Property (C)	Includes 75% of Coverage A limit, but can be decreased to 50%, 25%, 10%, or 0% *	50% of Coverage A Limit	70% of Coverage A Limit *
Deductible for dwelling and personal property	\$1,000	\$250	\$500

- ▶ California Department of Insurance online coverage comparison tool.
- ▶ Publicly accessible rebuild cost calculators.
- ▶ Guaranteed replacement cost coverage; though homeowners may prefer less coverage.
- ▶ Colorado House Bill 23-1174: Insurers must offer extended replacement cost policies of $>50\%$ of Cov. A (i.e. main dwelling). Annual report by Colorado Insurance Commissioner on reconstruction costs.

Discussion

Discussion



- ▶ Washington has not yet seen a statewide insurance catastrophe on the order of California and Oregon, but risk will grow over the coming decades.
- ▶ Some states moving to price risk more granularly w/ private or public CAT models.
- ▶ Large economic benefits from defensible space and wildfire-resilient building codes in high risk areas.
- ▶ Important that homeowners adequately insured for disaster risk.

Thank you.

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