

Note

SLOWING THE BURN: INCENTIVIZING SAFER DEVELOPMENT THROUGH WILDFIRE HAZARD MAPPING

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ABSTRACT

Climate change has accelerated the frequency and severity of natural disasters globally and wildfires are no exception. In part, wildfires have intensified due to climate change, short-sighted fire suppression policies, and the rapid influx of people and development in hazardous regions. Like other natural disasters, wildfires will continue to pose an ever-increasing threat to communities nationally. And the federal government's default approach of providing aid after disaster strikes will only continue to become more unsustainable as climate change worsens. Yet, proactive measures that exist to mitigate risk—such as hazard mapping and financial assistance to support adaptation and resilience at the local level—are often underfunded or, increasingly, nonexistent. This Note argues that federal aid should prophylactically prioritize risk reduction. By helping local and state governments identify at-risk regions through hazard mapping and conditioning future aid on proactive resilience efforts, Congress can ensure that federal spending reduces, rather than reacts to, the damage that future natural disasters will cause.

INTRODUCTION

The California neighborhood of Coffey Park was a planned residential development filled with family homes, tree-lined streets, and landscaped yards.¹ Tucked between farmland and Highway 101, Coffey Park developed

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1. Doug Smith & Nina Agrawal, *Despite Clear Risks, Santa Rosa Neighborhood That Burned Down Was Exempt from State Fire Regulations*, L.A. TIMES (Oct. 15, 2017, at 06:00 PT), <https://www.latimes.com/local/lanow/la-me-ln-coffey-park-explainer-20171011-story.html> [<https://perma.cc/7G6S-PPBS>].

in the 1980s as a “working class” neighborhood, though it grew more affluent in recent years as its residents “climb[ed] the rungs of the economic ladder.”² By 2017, the close-knit community grew to more than 1,300 homes.³ That year, however, the Tubbs Fire destroyed more than 1,200 of those homes.⁴ At around 9:45 p.m. on October 8, 2017, an electrical system next to a Napa County home ignited the fire.⁵ In just four hours, sixty-eight-mile-per-hour winds⁶ helped carry the fire over the six-lane Highway 101 more than twelve nautical miles into Coffey Park.⁷ At the time, the Tubbs Fire was the most destructive fire in California’s history, killing at least twenty-two people and destroying at least 5,200 homes and structures across Northern California.⁸

The fire was particularly devastating in Coffey Park because California state officials had not previously believed the neighborhood was at extreme risk of a wildfire.⁹ That is, the neighborhood sat outside of areas designated a “very high” Fire Hazard Severity Zone (“FHSZ”),¹⁰ a classification in California that evaluates the “probability level of a particular area”

2. Gabe Meline, *Coffey Park Elegy: Santa Rosa Writer Recalls the Spirit of a Lost Neighborhood*, SONOMA MAG. (Jan. 2018), <https://www.sonomamag.com/coffey-park-elegy-santa-rosa-writer-recalls-spirit-lost-neighborhood> [https://perma.cc/S2DT-5R6B].

3. *Id.*

4. Jennifer Calfas, *Why This Town Is Rebuilding One Year After a Destructive Wildfire—Knowing Another Fire Will Likely Come*, TIME (Oct. 8, 2018, at 16:08 EDT), <https://time.com/5411757/coffey-park-california-wildfire> [https://perma.cc/4J2R-F736].

5. Phil Barber, *A Walk in the Ashes of the Tubbs Fire: 5 Years After Sonoma County’s Worst Disaster*, PRESS DEMOCRAT (Oct. 3, 2022), <https://www.pressdemocrat.com/article/news/a-walk-in-the-ashes-of-the-tubbs-fire-five-years-later-in-sonoma-county> [https://perma.cc/7CT6-8SAQ]; Julie Johnson & Mary Callahan, *Cal Fire Says Tubbs Fire Caused by Private Electrical System, Not PG&E*, PRESS DEMOCRAT (Jan. 24, 2019), <https://www.pressdemocrat.com/article/news/cal-fire-says-tubbs-fire-caused-by-private-electrical-system-not-pge> [https://perma.cc/9YTE-FHCN].

6. Barber, *supra* note 5.

7. *Id.*; INT’L CITY/CNTY. MANAGERS ASS’N & INT’L ECON. DEV. COUNCIL, DISASTER CASE STUDIES: SANTA ROSA TUBBS FIRE 1 (2022), <https://icma.org/sites/default/files/2022-09/Santa%20Rosa%20case%20study%20v3.pdf> [https://perma.cc/9Q8T-XLQA].

8. Derek Watkins, Troy Griggs, Jasmine C. Lee, Haeyoun Park, Anjali Singhvi, Tim Wallace & Joe Ward, *How California’s Most Destructive Wildfire Spread, Hour by Hour*, N.Y. TIMES (Oct. 21, 2017), <https://www.nytimes.com/interactive/2017/10/21/us/california-fire-damage-map.html> [https://perma.cc/8MJ4-2E72].

9. See Calfas, *supra* note 4 (noting that “[n]eighborhoods like Coffey Park aren’t supposed to burn down like this” because suburban regions typically fall “outside of the state’s ‘very severe’ fire hazard zone”).

10. Smith & Agrawal, *supra* note 1 (“Because it was outside the officially mapped ‘very severe’ hazard zone, more than five miles to the east, Coffey Park was exempt from regulations designed to make buildings fire resistant in high-risk areas.”).

experiencing a wildfire.¹¹ Determined by California’s Department of Fire and Forest Protection (“Cal Fire”), this classification is based on several factors, including fire history, vegetation, terrain, and typical fire weather.¹² In California, a structure built within a FHSZ must comply with building codes designed to “resist the intrusion of flames,” with the goal of reducing total losses.¹³ In 2008, the state established a strict set of requirements, known as Chapter 7A, to ensure homes in fire-prone areas were more fire resistant.¹⁴ Chapter 7A includes regulations for roofing, siding, windows, decks, and the maintenance of defensible space around the property.¹⁵ Since the adoption of the codes, research has shown that these regulations have been “particularly effective at protecting structures from the types of wildfires that are increasingly common in California, where wind gusts can blow embers a mile or two . . . and do some of the worst damage,”¹⁶ as had occurred in Coffey Park.

Because Coffey Park’s density pushed it into an “urban designation”—and was therefore “considered unburnable” by fire specialists—homes in the neighborhood were exempt from Chapter 7A regulations.¹⁷ Yet, the Tubbs Fire devastated nearly the entire neighborhood.¹⁸ Shortly after the fire, Cal Fire revised its maps “to incorporate lessons from the Tubbs fire,” but revisions to the map recognizing the region’s risk of burning carried no legal consequences: Because Coffey Park was not designated as a “very severe” hazard zone,” the neighborhood “was exempt” from Chapter 7A regulations.¹⁹ Indeed, the California legislation that mandates hazard mapping actually limits the extent to which hazardous land in the state must comply with Chapter 7A.²⁰

11. *Fire Hazard Severity Zones*, CAL. DEP’T OF FORESTRY & FIRE PROT., <https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones> [<https://perma.cc/UYR2-34DH>].

12. *Id.*

13. CAL. CODE REGS. tit. 24, § 701A (2019) (mandating that only buildings in the state-responsibility area must comply with these building codes).

14. Dale Kasler & Phillip Reese, *‘The Weakest Link’: Why Your House May Burn While Your Neighbor’s Survives the Next Wildfire*, SACRAMENTO BEE (June 20, 2021, at 10:21 ET) [hereinafter Kasler & Reese, *The Weakest Link*], <https://www.sacbee.com/news/california/fires/article227665284.html> [<https://perma.cc/9VJF-JRAE>].

15. *Id.*

16. *Id.*

17. Smith & Agrawal, *supra* note 1.

18. *See supra* notes 2–4 (noting that of the roughly 1,300 homes in the Coffey Park neighborhood, more than 1,200 were destroyed).

19. *Id.*

20. *See infra* note 36 (describing how the current development “precautions vary according to the degree of assessed hazard” in a particular region, rather than applying uniformly across the state).

Not long after the 2017 Tubbs Fire, residents in Coffey Park began rebuilding.²¹ By 2019, the community had rebuilt more than six hundred of the homes that had burned down in the Tubbs Fire, with hundreds more under construction, largely ignoring the Chapter 7A building standards.²² As Coffey Park underwent reconstruction, its neighbor a few miles east, Fountaingrove, also began to rebuild following the 2017 fire season.²³ Unlike in Coffey Park, Cal Fire had mapped Fountaingrove as a “very high” FHSZ,²⁴ meaning homeowners were required to use fire-resistant building materials and comply with Chapter 7A in rebuilding.²⁵ Despite the threat of a future wildfire, Coffey Park residents largely ignored the stricter building codes.²⁶ For some in Coffey Park, resistance to state building codes came down to cost.²⁷ Research has shown, however, that “a new home built to wildfire-resistant codes can be constructed for roughly the same cost as a typical home.”²⁸ Yet, “some city councils have been squeamish . . . that the Chapter 7A code will inflate construction costs.”²⁹ Indeed, research suggests that it is “the perceived cost of implementing such regulations” that often

21. Conor Friedersdorf, *How To Rebuild from the Ashes*, ATLANTIC (Feb. 8, 2025), <https://www.theatlantic.com/ideas/archive/2025/02/santa-rosa-fire-rebuild/681603/> [https://perma.cc/8C4B-PVY5] (“Coffey Park residents rebuilt and reoccupied 80 percent of the houses there within three years.”).

22. Dale Kasler & Ryan Sabalow, *Burned-Out California Town Ignores Stricter Building Codes, Even with Wildfire Threat*, SACRAMENTO BEE (Nov. 15, 2019, at 05:00 ET), <https://www.sacbee.com/news/california/fires/article236909028.html> [https://perma.cc/Y2QX-F7WQ].

23. *Id.*; see also Paulina Pineda, *Fountaingrove Resurgence Continues Five Years After Tubbs Fire*, PRESS DEMOCRAT (Oct. 29, 2022), <https://www.pressdemocrat.com/article/news/fountaingrove-resurgence-continues-five-years-after-firestorm/> [https://perma.cc/MN3M-LS6P] (noting that as of 2022, about 1,130 homes had been rebuilt or were under construction after 1,600 homes in Fountaingrove were destroyed during the Tubbs Fire).

24. See Kasler & Sabalow, *supra* note 22 (noting that Fountaingrove is “no stranger[] to the strict Chapter 7A building standards”).

25. See *infra* note 40 and accompanying text (noting that heightened building codes apply only to “very high” FHSZ in California but that there are exemptions for land that is designated as either “high” or “moderate” in land managed by local governments).

26. Bill Gabbert, *Some California Neighborhoods Destroyed by Wildfire Being Rebuilt Without Fire-Safe Standards*, WILDFIRE TODAY (Apr. 23, 2019), <https://wildfiretoday.com/2019/04/23/some-california-neighborhoods-destroyed-by-wildfire-being-rebuilt-without-fire-safe-standards> [https://perma.cc/T3RA-EHH6] (“Although developers rebuilding Coffey Park are being urged to consider fire-resistant materials . . . the city doesn’t see any reason to impose the 7A code in the neighborhood.”).

27. See Kasler & Sabalow, *supra* note 22 (noting that some officials were “wary” of using the fire-resistant materials because they were often more expensive than other materials, potentially rising to 25 to 30 percent more in prices).

28. STEPHEN L. QUARLES & KELLY POHL, HEADWATER ECON., BUILDING A WILDFIRE-RESISTANT HOME: CODES AND COSTS 1 (2018), <https://headwaterseconomics.org/wp-content/uploads/building-costs-codes-report.pdf> [https://perma.cc/W5EB-2SMG].

29. Kasler & Reese, *The Weakest Link*, *supra* note 15.

poses a barrier to adopting stricter construction requirements.³⁰ However, some in Coffey Park chose not to build in accordance with heightened building codes because they believed the Tubbs fire was a “fluke,” unlikely to be repeated, and still others simply believed that if another fire were to tear through the community, no amount of precaution could stop their home from burning.³¹

FHSZ maps identify areas in the state that face heightened threat of wildfire based on the location’s proximity to flammable brush, its terrain, and its weather patterns³² so that residents can take mitigation measures.³³ The effectiveness of the maps, however, is hampered by the state’s patchwork approach to requiring compliance with Chapter 7A. In part, this piecemeal approach is due to challenges accounting for the likelihood of wildfires in dense, urban zones,³⁴ but it is also affected by how land ownership throughout the state allows local communities to avoid compliance with building codes. Responsibility for wildfire management in California is delegated based on land use and ownership to either the federal government, the California state government, or a local government within the state.³⁵ The Chapter 7A building codes apply only to “new buildings” in California state-responsibility areas, which account for about one-third of the state’s land,³⁶ and to new development in “High and Very High FHSZs” in

30. QUARLES & POHL, *supra* note 28, at 1.

31. Kasler & Sabalow, *supra* note 22.

32. See *Fire Hazard Severity Zones*, *supra* note 11 (describing how “hazard” accounts for factors “such as fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain, and typical fire weather for the area”).

33. See CAL. PUB. RES. CODE § 4201 (West 2024) (noting that the purpose of this code is to “identify[] measures” that “reduce the potential intensity of uncontrolled fires that threaten to destroy resources, life, or property.”).

34. See Calfas, *supra* note 4 (“Suburban and downtown areas typically sit outside of the state’s ‘very severe’ fire hazard zone . . .”).

35. Land in California is designated either state-responsibility areas, federal-responsibility areas or local-responsibility areas. In state-responsibility areas, Cal Fire is responsible for fire protection. State-responsibility-area land is “defined based on land ownership, population density and land use” and does not include federal land (which is classified as federal-responsibility areas), or local-responsibility areas, which “are typically densely populated areas and incorporated cities and may also include agricultural lands or portions of the desert.” See CAL. CODE REGS. tit. 24, § 701A (2019).

36. Hayley Smith, *California Bill Would Abolish State Fire Hazard Rankings; ‘True Insanity,’ Critics Say*, L.A. TIMES (Aug. 11, 2024, at 03:00 PT), <https://www.latimes.com/environment/story/2024-08-11/proposed-bill-would-abolish-california-fire-hazard-rankings> [<https://perma.cc/PC3B-2S8Z>]; Yoohyun Jung, *Here’s How Much of California Is Owned by Different Government Agencies and Why That Matters*, SF CHRONICLE (Jan 14, 2022), <https://www.sfchronicle.com/bayarea/article/Here-s-how-much-of-California-is-owned-by-16773882.php> [<https://perma.cc/E3U6-F5NU>] (noting that total land in California is “more than 104 million acres”).

local-responsibility areas.³⁷

There is, however, a loophole for bypassing the stricter requirements of Chapter 7A in local-responsibility areas for land that does not meet the “High and Very High FHSZ” threshold: All land in state-responsibility areas must comply with Chapter 7A, whereas only extremely risky land in local-responsibility areas must comply with the building codes. Accordingly, land that FHSZ maps identify as hazardous, which would otherwise be subject to building codes in state-responsibility areas, becomes exempt if responsibility for the land transitions from the state to a local government because local governments need only adopt and enforce Chapter 7A in Very High FHSZ, but not areas designated “High” or “Moderate.”³⁸ Not long after the Tubbs Fire, the Northern California city of Folsom capitalized on this loophole. To develop land bordering the city, Folsom annexed land previously designated as state-responsibility areas so that any development on the land would no longer be subject to building codes.³⁹

For many local governments allowing development in high-risk regions without regard to fire risk, “short-term thinking can triumph over common sense.”⁴⁰ The issue of short-sightedness is not limited to California; indeed, local governments across the country weigh the benefits of more development, and thus higher tax revenues, against the risks associated with building in hazardous zones.⁴¹ Increasingly, this balancing act falls in favor of development in hazardous regions.⁴²

37. CAL. DEP’T OF FORESTRY & FIRE PROT., FIRE HAZARD SEVERITY ZONES LOC. RESP. AREA 10, <https://www.counties.org/wp-content/uploads/2025/03/lra-legislation-factsheet-flipbook-combined.pdf> [<https://perma.cc/SD2T-K3CJ>].

38. See Kasler & Reese, *supra* note 14. (“Local governments have the discretion of rejecting the Cal Fire designation . . . [S]ome city councils have been squeamish about the state’s maps because of fears that the Chapter 7A code will inflate construction costs . . .”).

39. Dale Kasler & Phillip Reese, *Which Houses Survived Wildfire? Often, Those Built to Code*, PHYS.ORG (Apr. 11, 2019) [hereinafter Kasler & Reese, *Which Houses Survived Wildfire?*], <https://phys.org/news/2019-04-houses-survived-wildfire-built-code.html> [<https://perma.cc/H6XC-3JG5>]; see also *Annexation*, CITY OF BAKERSFIELD, <https://www.bakersfieldcity.us/277/Annexation> [<https://perma.cc/7NY6-NLEG>] (“Annexation is the process by which a city adds land to its jurisdiction.”).

40. *Build To Survive: Homes in California’s Burn Zones Must Adopt Fire-Safe Code*, SACRAMENTO BEE (Apr. 21, 2019, at 11:18 ET), <https://www.sacbee.com/opinion/editorials/article229425004.html> [<https://perma.cc/9PCM-MML3>].

41. See, e.g., Hallie Eakin, Svenja Keele & Vanessa Lueck, *Uncomfortable Knowledge: Mechanisms of Urban Development in Adaptation Governance*, WORLD DEV., Aug. 9, 2022, at 1, 12, <https://doi.org/10.1016/j.worlddev.2022.106056> [<https://perma.cc/AU2S-FMA3>] (addressing how local governments, often facing economic pressure, may permit development in high-risk areas to support their tax base).

42. Mira Rojanasakul & Nadja Popovich, *Where Americans Have Been Moving into Disaster-Prone Areas*, N.Y. TIMES (Sept. 30, 2024), <https://www.nytimes.com/interactive/2024/09/30/climate/am>

Despite the challenge of implementing uniform standards across the state, California has developed a robust wildfire-mapping system.⁴³ For most other states, there are “limited or no available wildfire hazard and risk maps to trigger planning and building safety provisions,” which means that many developments are “constructed in high fire risk areas without appropriate building fire safety provisions.”⁴⁴ As the climate warms across the country, and wildfire seasons become longer and more disastrous,⁴⁵ it will become even more critical to enact fire-mitigation measures, such as building codes, at the local level. To do so, however, local communities must be able to accurately identify risk, which can be aided by adequate mapping.

Maps of natural-disaster hazards do exist on a national level. Since 2016, the Federal Emergency Management Agency (“FEMA”) has provided the National Risk Index (“NRI”), which analyzes county-level data for the entire country and assigns a risk score for eighteen natural disasters, including wildfires.⁴⁶ Unlike the Cal Fire model, however, the NRI does not include in its fire risk assessment any physical surroundings at the community level—such as weather patterns, potential fire behavior, or proximity to highly flammable terrain.⁴⁷ Considering only “a community’s relative risk for [w]ildfires when compared to the rest of the United States”⁴⁸ has resulted in an overbroad mapping system that underestimates risk. FEMA, itself, provides a disclaimer that the NRI “was created for broad nationwide comparisons,” and should not be used as “a substitute for

ericans-moving-hurricane-wildfire-risk.html [https://perma.cc/XE3G-7BE3] (identifying counties across the country that are often hit by natural disasters, including hurricanes, wildfires, and floods, yet have been among the most popular places to move for the past twenty years).

43. Ben Christopher, *New Fire Maps Put Nearly 4 Million Californians in Hazardous Zones. What Does That Mean for the People Who Live There?*, CALMATTERS (Mar. 24, 2025), <https://calmatters.org/housing/2025/03/calfire-maps-hazard-california/> [https://perma.cc/6BBP-JVM4] (discussing how Cal Fire’s risk mapping has identified increased risks over the last decade).

44. FEMA, MARSHALL FIRE MITIGATION ASSESSMENT TEAM: BEST PRACTICES FOR WILDFIRE-RESILIENT SUBDIVISION PLANNING 3 (2023) [hereinafter MARSHALL FIRE MITIGATION ASSESSMENT], https://www.fema.gov/sites/default/files/documents/fema_rsl_marshall-mat-best-practices-for-wildfire-resilient-subdivision-planning_042025.pdf [https://perma.cc/R7EY-HUGW].

45. *Wildfire Climate Connection*, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.noaa.gov/noaa-wildfire/wildfire-climate-connection> [https://perma.cc/9MMQ-W6PT] (last updated July 24, 2023).

46. *Wildfire Risk Index Explained*, W. FIRE CHIEFS ASS’N (Mar. 1, 2024), <https://wfca.com/wildfire-articles/wildfire-risk-index-explained> [https://perma.cc/7YTU-6KUW].

47. See *Wildfire*, FEMA NAT’L RISK INDEX, <https://hazards.fema.gov/nri/wildfire> [https://perma.cc/V7XX-GKW3] (noting how the NRI calculates a region’s risk exposure based on a community’s building value, its potential population loss, and agriculture value, rather than these other factors considered by the Cal Fire model).

48. *Id.*

localized risk assessment analysis.”⁴⁹ Moreover, the NRI “does not consider the intricate economic and physical interdependencies that exist across geographic regions,”⁵⁰ which leads some hazard-mitigation experts to believe users “shouldn’t put too much stock in it.”⁵¹

Although existing NRI maps do not adequately represent the danger of development in fire-prone regions, even with more accurate mapping systems, state and local governments may still be inclined to permit high-risk development due to concerns over cost.⁵² After all, many residents in Coffey Park who were suddenly made aware of their home’s susceptibility to fire nevertheless ignored stricter building codes due to concerns over perceived cost.⁵³ Accordingly, a second factor that must be addressed to encourage safer development at the local level is cost mitigation. Already, there are streams of federal “funding for eligible long-term solutions that reduce the impact of disasters in the future.”⁵⁴ Currently, however, significantly more funding is directed towards community support after a disaster strikes, with much less allocated towards mitigation efforts.⁵⁵ As climate change increases the frequency and severity of wildfires,⁵⁶ funding relief after a wildfire will not only become prohibitively expensive, but will also leave residents in hazardous regions vulnerable to the effects of deadly wildfires.

49. *Disclaimer*, FEMA NAT’L RISK INDEX, <https://hazards.fema.gov/nri/disclaimer> [<https://perma.cc/NXH3-PYYA>].

50. *Id.*

51. Eric Scigliano, *It’s Only a Matter of Time Before a Tsunami Hits the Northwest. Why Is It Missing from FEMA’s Risk Analysis?*, POLITICO (Dec. 14, 2023, at 05:00 EST), <https://www.politico.com/news/magazine/2023/12/14/tsunami-risk-index-fema-washington-00131544> [<https://perma.cc/G2A2-WUPR>].

52. See Kasler & Reese, *The Weakest Link*, *supra* note 14 (describing how advanced maps demonstrated wildfire risks in California and yet authorities approved housing developments without adequate protections); Harrison Kelly, *How Municipalities Can Drive Local Economic Development*, GOVPILOT, <https://www.govpilot.com/blog/municipality-led-local-economic-development> [<https://perma.cc/SVQ2-XDAH>] (describing how “[e]conomic development means more business registration, construction projects, and new constituents . . . [as well as a]n increase in tax income and application fees from construction permits and other licenses . . .”).

53. See Kasler & Sabalow, *supra* note 22 (discussing how the city encouraged residents to build with more fire-safe materials, but opted not to require them because “officials were wary, in part, of making the reconstruction of Coffey Park too expensive”).

54. *Hazard Mitigation Assistance Grants*, FEMA, <https://www.fema.gov/grants/mitigation> [<https://perma.cc/2WPN-BVSX>].

55. *2023 by the Numbers*, FEMA (Jan. 21, 2025), <https://www.fema.gov/blog/2023-numbers> [<https://perma.cc/Y3UC-4F95>] (noting that in 2023, more than \$11 billion was spent on aid after disaster, whereas only \$3 billion was allocated to “grants for climate resilient communities”).

56. *Climate Change Indicators: Wildfires*, EPA, <https://www.epa.gov/climate-indicators/climate-change-indicators-wildfires> [<https://perma.cc/2DDT-3UWW>].

This Note argues that state and local governments must have access to maps that adequately reflect wildfire hazard and that existing federal funding programs should be modified to allocate more funding towards fire-mitigation efforts, including the encouragement of fire-safe development at the local level. To achieve this, FEMA should delegate responsibility for its NRI-mapping-system development to the states, which can, in turn, produce maps akin to those developed by Cal Fire, which look at “fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain, and typical fire weather for the area.”⁵⁷ It would then be incumbent on states to adopt building codes that reflect heightened risks for homeowners in these areas. Although Congress cannot mandate the implementation of these codes at the state or local level,⁵⁸ it can modify existing incentive structures to encourage the adoption of these codes at the local level.

This Note proceeds in three parts: Part I describes the current state of wildfires in the country and why the proportion of the country at risk of wildfires is growing. Part II discusses current natural disaster mapping efforts by FEMA and state agencies, identifying opportunities for improving existing mapping to more accurately predict wildfire risk. This section will also discuss modifications that FEMA can make to improve hazard mapping at the local level. Part III argues that federal incentive structures should be modified to encourage state adoption of building and zoning codes that adequately correspond to a region’s wildfire risk.

I. WILDFIRES: A NATIONAL PROBLEM

Conventionally, wildfires are a problem of the western United States. Certainly, a greater proportion of wildfire risk exists in this region, but among the approximately 145 million housing units nationally, nearly 80 million units across the country are at significant risk of fire exposure.⁵⁹ As the climate warms, even more people will face the risk of wildfire, with one estimate indicating that “[n]early half of all Americans who live in areas vulnerable to fire will reside in the South.”⁶⁰

57. *Fire Hazard Severity Zones*, *supra* note 11.

58. *See, e.g.*, *New York v. United States*, 505 U.S. 144, 188 (1992) (“The Federal Government may not compel the States to enact or administer a federal regulatory program.”).

59. John Muyskens, Andrew Ba Tran, Naema Ahmed & Anna Phillips, *1 in 6 Americans Live in Areas with Significant Wildfire Risk*, WASH. POST (May 17, 2022), <https://www.washingtonpost.com/climate-environment/interactive/2022/wildfire-risk-map-us> [<https://perma.cc/3KFJ-WNXN>].

60. *Id.*

Although climate change is a primary driver of more frequent and severe wildfires, the explosion of people living in regions where human development borders natural, undeveloped land—known as wildland-urban interface (“WUI”) zones—has also been a major factor in increasing the threat of wildfires.⁶¹ The following section discusses three of the primary drivers of the growing wildfire risk nationally, beginning with a discussion on climate change in Part A, then describing the impacts of fire suppression policies in Part B, and ending with the effect of human encroachment in WUI zones in Part C.

A. Climate Change

Human-caused global warming has contributed to increased wildfire risk.⁶² The accumulation of atmospheric greenhouse gases leads to warmer temperatures and decreased levels of precipitation, which can then contribute to extended periods of drought.⁶³ These drier conditions, in turn, “enhance the flammability of vegetative fuels,” making it easier for fires to ignite and spread.⁶⁴ Already, the effects of warming are apparent. Since 1901, temperatures in the United States have risen at an average rate of 0.17 degrees Fahrenheit each year, though warming has been accelerating in recent decades.⁶⁵ Unsurprisingly, this warming has coincided with increasingly frequent and severe wildfires.⁶⁶

61. See Franz Schug, Avi Bar-Massada, Amanda R. Carlson, Heather Cox, Todd J. Hawbaker, David Helmers, Patrick Hostert, Dominik Kaim, Neda K. Kasraee, Sebastián Martinuzzi, Miranda H. Mockrin, Kira A. Pfoch & Volker C. Radeloff, *The Global Wildland–Urban Interface*, 621 NATURE 94, 94 (July 19, 2023), (noting that because of “its proximity to natural amenities,” WUI zones tend to attract human settlement, which has led to “sprawl into fire-dependent ecosystems”).

62. Rong Fu, *Study Shows That Climate Change Is the Main Driver of Increasing Fire Weather in the Western U.S.*, NOAA: NAT’L INTEGRATED DROUGHT INFO. SYS. (Nov. 9, 2021), <https://www.drought.gov/news/study-shows-climate-change-main-driver-increasing-fire-weather-western-us> [<https://perma.cc/WMY3-SGBC>] (noting that that “climate change is the main driver of this increase in fire weather in the western United States”).

63. *Climate Change Indicators: U.S. and Global Temperature*, EPA, <https://www.epa.gov/climate-indicators/climate-change-indicators-us-and-global-temperature> [<https://perma.cc/RTL8-FMS2>].

64. Glen MacDonald, Tamara Wall, Carolyn A. F. Enquist, Sarah R. LeRoy, John B. Bradford, David D. Breshears, Timothy Brown, Daniel Cayan, Chunyu Dong, Donald A. Falk, Erica Fleishman, Alexander Gershunov, Molly Hunter, Rachel A. Loehman, Phillip J. van Mantgem, Beth Rose Middleton, Hugh D. Safford, Mark W. Schwartz & Valerie Trouet, *Drivers of California’s Changing Wildfires: A State-of-the-Knowledge Synthesis*, 32 INT’L J. WILDLAND FIRE 1039, 1043 (2023).

65. *Climate Change Indicators: U.S. and Global Temperature*, *supra* note 63.

66. Erin Martin-Jones, *Extreme Wildfires Are Getting More Extreme and Occurring More Often*, EOS (July 26, 2024), <https://eos.org/articles/extreme-wildfires-are-getting-more-extreme-and-occurring-more-often> [<https://perma.cc/B4WS-4HB6>].

Indeed, “the frequency and intensity of extreme wildfires have more than doubled in the last two decades.”⁶⁷ Currently, the fire season in western states, which averaged five months in the 1970s, now averages seven months.⁶⁸ Likewise, southern states increasingly face a heightened risk of wildfires.⁶⁹ By contrast, in the Midwest and Northeast, the “moist climate and abundant vegetation typically keep[] fires from raging out of control.”⁷⁰

As the West and Southeast become progressively warmer and drier, the “incidence and severity of fire” will likely increase, which “will generate corresponding environmental impacts,” including the displacement of wildlife and an adverse impact on water supplies.⁷¹ One estimate projects that the number of residents in western states living in areas with significant wildfire risk will increase to nearly 40 percent by 2052; more than 25 percent of residents living in the South will also face a similar risk by that time.⁷²

Despite the regular incidence of hurricanes and tidal flooding in southern states, increased periods of drought and higher temperatures will likely change wildfire behavior in the region.⁷³ Currently, the Southeast “has the greatest area burned by prescribed fire [and] the highest number of wildfires” in the country and contains “significant hotspots of biodiversity, much of which is dependent on frequent fire.”⁷⁴ Indeed, “controlled burning

67. Austyn Gaffney, *Extreme Wildfires Have Doubled in 2 Decades, Study Finds*, N.Y. TIMES (June 24, 2024), <https://www.nytimes.com/2024/06/24/climate/extreme-wildfires-have-doubled-in-2-decades-study-finds.html> [https://perma.cc/RR2U-7VVC].

68. WILDLAND FIRE MITIGATION & MGMT. COMM’N, USDA, ON FIRE: THE REPORT OF THE WILDLAND FIRE MITIGATION AND MANAGEMENT COMMISSION 10 (2023), <https://www.usda.gov/sites/default/files/documents/wfmnc-final-report-09-2023.pdf> [https://perma.cc/U7DB-QEWQ].

69. See LARS Y. POMARA, NICHOLAS P. GOULD, SANDHYA NEPAL, KRISTEN D. EMMETT, SCOTT L. GOODRICK & DANNY C. LEE, U.S. FOREST SERV., FIRE: AN ANALYSIS TO SUPPORT THE SOUTHERN FOREST OUTLOOK 3 (2025), https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs280.pdf [https://perma.cc/X94F-LM6H] (noting that fire risk in the Southern United States is expected to grow).

70. Kristoffer Tigue, *From Michigan to Nebraska, Midwest States Face an Early Wildfire Season*, INSIDE CLIMATE NEWS (Mar. 28, 2024), <https://insideclimatenews.org/news/28032024/midwest-early-wildfire-season> [https://perma.cc/W29F-9C34].

71. Robert B. Keiter, *Wildfire Policy, Climate Change, and the Law*, 1 TEX. WESLEYAN J. REAL PROP. L. 87, 94, 97 (2022).

72. Muyskens et al., *supra* note 59 (noting that currently, about 32 percent of the West’s population lives in an area with significant wildfire risk, whereas that figure is about 18 percent in the South, while the risk to the Midwest and Northeast regions is expected to remain relatively low).

73. See *id.* (discussing how “climate change is extending the Southeastern coastal region’s traditional fire season through baking temperatures and increasingly severe droughts”).

74. Robert J. Mitchell, Yongqiang Liu, Joseph J. O’Brien, Katherine J. Elliott, Gregory Starr, Cheley Ford Miniati & J. Kevin Hiers, *Future Climate and Fire Interactions in the Southeastern Region of the United States*, 327 FOREST ECOLOGY & MGMT. 316, 316 (2014).

has become part of the social fabric” in several southern states.⁷⁵ These prescribed fires reduce the severity of wildfires generally, but variability in the amount of rainfall and hurricane activity, as well as increased temperatures and periods of drought, may lead to “long-term shifts in forest composition from climate-altered fire regimes.”⁷⁶ The effects of climate change, therefore, will “create warmer, drier conditions, leading to longer and more active fire seasons” not only in western states familiar with prolonged fire seasons, but also in southern states that already face hurricane and flooding threats.⁷⁷

B. Decades of Fire Suppression

Climate change is not the only driver of increasingly frequent and severe wildfires across the country. Decades of wildfire suppression have also contributed to poor forest health and the accumulation of flammable vegetation, or fuel, in hazardous regions.⁷⁸ Despite its potential risks to communities, fire plays a critical role in maintaining the health and biodiversity of ecosystems.⁷⁹ Prior to European settlement in the sixteenth century, Indigenous tribes in the United States intentionally set fires “to produce food and fiber . . . to promote hunting, and to reduce pest populations.”⁸⁰ This practice, known as prescribed burning, enabled the Indigenous people to manage the land to promote ecological diversity and the growth of beneficial vegetation while clearing the land for wildlife and

75. Lauren Sommer, *Why the South Is Decades Ahead of the West in Wildfire Prevention*, NPR (Aug. 31, 2021, at 05:08 ET), <https://www.npr.org/2021/08/31/1029821831/to-stop-extreme-wildfires-california-is-learning-from-florida> [<https://perma.cc/DP47-TEFV>].

76. Mitchell et al., *supra* note 74, at 316.

77. *Wildfire and Climate Connection*, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.noaa.gov/noaa-wildfire/wildfire-climate-connection> [<https://perma.cc/VG7T-W6JY>] (last updated July 24, 2023).

78. *Fueling Wildfires: The Role of Wildfire Fuel & How To Manage It*, FIRE SCOPE, <https://www.firescope.org/wildfire-fuel/> [<https://perma.cc/JV46-3XF4>] (defining wildfire fuel as “any organic material that can ignite and sustain a fire,” including vegetation like “[g]rasses, bushes, trees, and dead leaves”).

79. See Reed F. Noss, Jerry F. Franklin, William L. Baker, Tania Schoennagel & Peter B. Moyle, *Managing Fire-Prone Forests in the Western United States*, 4 FRONTIERS ECOLOGY & ENV’T, 481, 481–82 (2006) (“Fire provides fundamental services, including recycling nutrients, regulating the density and composition of young trees, creating and shaping wildlife and fish habitat, structuring the spatial pattern of landscapes, and influencing water and sediment delivery across watersheds.”).

80. Clarke A. Knight, Lysanna Anderson, M. Jane Bunting, Marie Champagne, Rosie M. Clayburn, Jeffrey N. Crawforde, Anna Klimaszewski-Patterson, Eric E. Knapp, Frank K. Lake, Scott A. Mensing, David Wahl, James Wanket, Alex Watts-Tobin, Matthew D. Potts & John J. Battles, *Land Management Explains Major Trends in Forest Structure and Composition over the Last Millennium in California’s Klamath Mountains*, PROCS. NAT’L ACAD. SCI. U.S., Mar. 14, 2022, at 1, 2–3.

reducing the likelihood of severe wildfires.⁸¹ Prescribed burning helps to remove the buildup of fuel while also thinning out overcrowded forests.⁸² As a result, when a fire does start, there is simply less fuel to burn,⁸³ thereby reducing the severity of the fire.⁸⁴

But with European development and the United States' later annexation of this land, practices of prescribed burning faltered, while settlers increasingly razed forests and grasslands for agriculture and livestock grazing.⁸⁵ By the early twentieth century, the U.S. Forest Service, a federal agency initially established by Congress "to provide quality water and timber,"⁸⁶ implemented a national policy of extinguishing every fire as quickly as possible.⁸⁷ In part, this policy was due to Congress's belief that fire was destroying U.S. forests.⁸⁸ By midcentury, however, federal land management agencies shifted their policies to allow some fires to burn, recognizing both the difficulty of accessing remote forests where fires often burn and the ecological value of fire for many ecosystems.⁸⁹ By this time, however, decades of fire suppression policies had already led to a "huge

81. *Indigenous Fire Practices Shape Our Land*, NAT'L PARK SERV., <https://www.nps.gov/subjects/fire/indigenous-fire-practices-shape-our-land.htm> [<https://perma.cc/C8E4-XYMN>] (last updated Mar. 18, 2024) (discussing the impacts of prescribed, or "cultural burning," which was used by the Native Americans, Alaska Natives, and Native Hawaiians for millennia.).

82. *Prescribed Fire: Benefits for People and the Land*, U.S. FOREST SERV., <https://www.fs.usda.gov/detail/tahoe/landmanagement/resourcemanagement/?cid=fseprd1024446> [<https://perma.cc/R422-3K9F>].

83. *Wildland Fire: What Is a Prescribed Fire?*, NAT'L PARK SERV., <https://www.nps.gov/articles/what-is-a-prescribed-fire.htm> [<https://perma.cc/V4B5-JYJT>] (last updated Apr. 15, 2025) (noting that prescribed fires can be used to "reduce hazardous fuel loads near developed areas").

84. Rob Jordan, *Controlled Burns Shown To Reduce Wildfire Intensity and Smoke Pollution*, STANFORD REP. (June 26, 2025), <https://news.stanford.edu/stories/2025/06/controlled-prescribed-burns-wildfire-intensity-smoke-pollution> [<https://perma.cc/VQP8-FGJD>] (discussing research that shows "prescribed burns can reduce the severity of subsequent wildfires by an average of 16% and net smoke pollution by an average of 14%").

85. Scott L. Stephens & Neil G. Sugihara, *Fire Management and Policy Since European Settlement*, in *FIRE IN CALIFORNIA'S ECOSYSTEMS* 431, 433–34 (Neil Sugihara ed. 2006) (discussing how settlers cleared land for livestock grazing, while the federal government implemented fire suppression policies aimed at putting out fires quickly).

86. *Meet the Forest Service*, U.S. FOREST SERV., <https://www.fs.usda.gov/about-agency/meet-forest-service> [<https://perma.cc/L6L2-SEYZ>].

87. Stephens, *supra* note 85, at 434 (explaining that this policy was referred to as the "10 AM" policy, which sought to "increas[e] suppression efficiency" by ensuring any fire was under control by 10 o'clock the morning after ignition).

88. *Id.* at 433.

89. See Keiter, *supra* note 71, at 89 (discussing the transition to viewing "fire as an important regenerative process," while also recognizing the significant "[c]ost factors associated with fighting fires in remote locations where neither lives nor property were at risk").

accumulation of fuel loads” within forested ecosystems, which left them vulnerable to even more catastrophic wildfires.⁹⁰

The U.S. Department of the Interior (“DOI”) collaborates with other federal and state agencies across the country to treat millions of acres each year by starting prescribed fires, thinning overgrown forested areas, and removing flammable vegetation by hand, with machinery, and through domestic grazing animals.⁹¹ In 2024, the DOI treated 2.36 million acres nationally;⁹² although these efforts reduce the risk of severe wildfires, the extent of the treatment simply is not sufficient to account for the growing amount of land threatened by wildfires.⁹³ In California, alone, “the state [has] struggl[ed] to get anywhere close to the targets they have for prescribed fire.”⁹⁴ Consequently, the United States has witnessed several devastating wildfire seasons. From 2003 to 2023, the “frequency and intensity of extreme wildfires have more than doubled.”⁹⁵ Although climate change and fire suppression have certainly contributed to the increasingly severe fire threat in the United States, the number of people moving into hazardous regions further exacerbates this risk.

C. Human Development in Wildland-Urban Interface Zones

Concurrent with worsening wildfire conditions is the encroachment of human development in fire hazard zones across the country. These areas, known as WUI zones, are regions “where wildfires pose the greatest risk to people due to the proximity of flammable vegetation.”⁹⁶ WUI zones are places “where forests and humans come together” and often lead to several

90. Elizabeth Shogren, *A Century of Fire Suppression Is Why California Is in Flames*, MOTHER JONES (Dec. 12, 2017), <https://www.motherjones.com/environment/2017/12/a-century-of-fire-suppression-is-why-california-is-in-flames> [https://perma.cc/GY2Y-4PCG].

91. *Fuels Management*, U.S. DEP’T OF THE INTERIOR, <https://www.doi.gov/wildlandfire/fuels> [https://perma.cc/CT6F-FYY9].

92. *Id.*

93. See Crystal A. Kolden, *We’re Not Doing Enough Prescribed Fire in the Western United States to Mitigate Wildfire Risk*, FIRE 1, 1 (2019), <https://doi.org/10.3390/fire2020030> [https://perma.cc/SVG7-W5FN] (arguing that the relatively limited use of prescribed burning by federal agencies is contributing to “the potential for more wildfire disasters”).

94. Kate Selig, *In California, Controlled Fires Can Save Homes. Why Aren’t More Happening?*, N.Y. TIMES (Sept. 7, 2024, 5:00 AM), <https://www.nytimes.com/2024/09/07/us/california-controlled-fire.html> [https://perma.cc/YQ97-REWY].

95. Gaffney, *supra* note 67.

96. Volker C. Radeloff, David P. Helmers, H. Anu Kramer, Miranda H. Mockrin, Patricia M. Alexandre, Avi Bar-Massada, Van Butsic, Todd J. Hawbaker, Sebastián Martinuzzi, Alexandra D. Syphard & Susan I. Stewart, *Rapid Growth of the US Wildland-Urban Interface Raises Wildfire Risk*, 115 PROC. NAT’L ACAD. SCI. 3314, 3314 (2018).

problems.⁹⁷ Not only are more people exposed to the risk of wildfire, but also the influx of more people increases the risk that a fire will ignite.⁹⁸ The vulnerability of southern states to wildfire risk is tied directly with the rapid expansion of human development in WUI zones.⁹⁹ Moreover, homeowners in these zones, despite often living in remote and difficult-to-access regions, expect fire emergency services to protect their homes from fire, thereby increasing costs and raising safety concerns for firefighters.¹⁰⁰

In California, for example, research has found that more than 80 percent of all buildings destroyed by wildfires between 1985 and 2013 were in WUI zones.¹⁰¹ As of 2020, about 9 percent of land across the country was classified as WUI zones but contained nearly one-third of all houses.¹⁰² Between 1990 and 2020, the number of homes in WUI zones increased by 46 percent, from 30 million to 44 million.¹⁰³

In part, this rapid growth in rural communities has been driven by the lack of affordability of urban areas. Research suggests that in the last 30 years, the disbursement of people is “increasingly ‘affordability-driven,’ i.e., a result of the need to find housing within commuting distance of ‘out-of-reach’ metros.”¹⁰⁴ Prior to the 1990s, moves into rural communities were

97. Toddi A. Steelman & Caitlin A. Burke, *Is Wildfire Policy in the United States Sustainable?*, 105 J. FORESTRY 67, 68 (2007).

98. Jennifer K. Balch, Bethany A. Bradley, John T. Abatzoglou, R. Chelsea Nagy, Emily J. Fusco & Adam L. Mahood, *Human-Started Wildfires Expand the Fire Niche Across the United States*, 114 PROC. NAT’L ACAD. SCI. U.S. 2946, 2946 (2017), <https://doi.org/10.1073/pnas.1617394114> [<https://perma.cc/TLV6-6563>] (“Human-started wildfires accounted for 84% of all wildfires, tripled the length of the fire season, dominated an area seven times greater than that affected by lightning fires, and were responsible for nearly half of all area burned.”).

99. See *Why Wildfires Aren’t Just a Western Problem: The Truth About Year-Round Wildfire Risks in the South*, S. GRP. STATE FORESTERS (Sept. 10, 2024) [hereinafter *Wildfires Aren’t Just a Western Problem*], <https://southernforests.org/2024/09/10/why-wildfires-arent-just-a-western-problem-the-truth-about-year-round-wildfire-risks-in-the-south> [<https://perma.cc/DE36-WRD6>] (noting that Southern states are particularly vulnerable because they “have some of the largest and fastest-growing WUI areas in the country”).

100. *Id.*

101. Heather Anu Kramer, Miranda H. Mockrin, Patricia M. Alexandre & Volker C. Radeloff, *High Wildfire Damage in Interface Communities in California*, 28 INT’L J. WILDLAND FIRE 641, 645 (2019).

102. *Wildland-Urban Interface Growth in the U.S.*, U.S. FOREST SERV., <https://research.fs.usda.gov/nrs/projects/wuigrowth#research> [<https://perma.cc/ESL7-NGWG>].

103. MIRANDA MOCKRIN, U.S. FOREST SERV. N. RSCH. STATION, WHERE HUMANS AND FORESTS MEET: THE RAPIDLY GROWING WILDLAND-URBAN INTERFACE I (2024), https://www.fs.usda.gov/nrs/pubs/Roofed-in-Research/nrs_roofed-res_28-april2024.pdf [<https://perma.cc/S5S9-79KD>].

104. Miriam Greenberg, Hillary Angelo, Elena Losada & Christopher C. Wilmers, *Relational Geographies of Urban Unsustainability: The Entanglement of California’s Housing Crisis with WUI Growth and Climate Change*, PROC. NAT’L ACAD. SCI., July 29, 2024, at 1, 5.

driven by a desire to live in remote, natural environments for “recreational, familial, or other cultural reasons.”¹⁰⁵

Nonetheless, fighting fires in WUI zones is often more difficult and expensive due to these regions’ “remoteness, steep slopes, and narrow roads.”¹⁰⁶ The people living in these regions also contribute to the increase in wildfires. People not only cause the vast majority of wildfires,¹⁰⁷ but human-ignited fires also grow more quickly and inflict more severe damage because they frequently occur in locations with less tree cover and during periods of drier and windier weather, which are more prone to fires.¹⁰⁸ Accordingly, expansion into WUI zones is one of the primary drivers of the predicted increase in fire hazard in the South.¹⁰⁹ Although the highest number of people living in WUI zones is in California¹¹⁰—more than 11 million people¹¹¹—several states with the largest proportion of WUI land also include North Carolina, Texas, and Pennsylvania.¹¹² In one study of eleven states in the West, 14 percent of available land in WUI zones had been developed, “leaving great potential for new home construction in the remaining 86%.”¹¹³ As this development of available WUI land continues to increase, so too will the risk of wildfires.¹¹⁴

Scholars have extensively examined the risks associated with development in WUI zones. Many argue for policies that integrate climate change adaptation strategies into wildfire management, while others propose

105. *Id.*

106. Patricia Gude, Ray Rasker & Jeff van den Noort, *Potential for Future Development on Fire-Prone Lands*, 106 J. FORESTRY 198, 198 (2008).

107. Jane Braxton Little, *The Worst Wildfires Are Started by People. Here’s How*, SCI. AM. (Nov. 1, 2023), <https://www.scientificamerican.com/article/the-worst-wildfires-are-started-by-people-heres-how> [<https://perma.cc/78FB-68AL>]; see also *What Causes Wildfires?*, W. FIRE CHIEFS ASS’N (July 5, 2022), <https://wfca.com/wildfire-articles/what-causes-wildfires> [<https://perma.cc/5NDQ-244U>] (explaining that common triggers for human-caused wildfires include “discarded cigarettes, unattended campfires, burning debris, or . . . equipment malfunctions”).

108. Stijn Hantson, Niels Andela, Michael L. Goulden & James T. Randerson, *Human-Ignited Fires Result in More Extreme Fire Behavior and Ecosystem Impacts*, NATURE COMM’NS, May 17, 2022, at 1, 1.

109. *Wildfires Aren’t Just a Western Problem*, *supra* note 99.

110. *What is the WUI?*, U.S. FIRE ADMIN., <https://www.usfa.fema.gov/wui/what-is-the-wui> [<https://perma.cc/Q3HG-5XTL>].

111. *Wildland-Urban Interface*, THEODORE PAYNE FOUND., <https://theodorepayne.org/wildland-urban-interface> [<https://perma.cc/3AV8-9PKA>].

112. *Understanding the Wildland-Urban Interface (1990-2020)*, USDA FOREST SERV. N. RSCH. STATION (Sept. 20, 2023), <https://storymaps.arcgis.com/stories/6b2050a0ded0498c863ce30d73460c9e> [<https://perma.cc/YM8N-2K8D>].

113. Gude et al., *supra* note 106, at 198.

114. Greenberg et al., *supra* note 104, at 1.

changes to land-use planning,¹¹⁵ enhanced fuel-reduction protocols,¹¹⁶ and greater funding to shift from an approach of wildfire suppression to one of forest health restoration.¹¹⁷ This Note, however, focuses on the need for improved mapping of wildfire hazards coupled with enhanced federal incentive programs that encourage local communities to adopt stronger building codes for development in hazardous regions. Ultimately, this Note proposes that such programs can mitigate high-risk construction that local governments may otherwise be incentivized to develop without regard for heightened fire-safe building codes.

II. NATURAL DISASTER MAPPING

To reduce the risk of wildfire nationally, particularly for communities in WUI zones, Congress should support the development of maps that more accurately identify current wildfire hazard zones and regions facing heightened risk due to a warming climate. Mapping can be one of the earliest steps to ensure communities and homeowners can prepare for climate disasters.¹¹⁸ And accurate mapping enables targeted land-management strategies that mitigate risk.¹¹⁹ Already, FEMA maps risks for eighteen natural disasters through its NRI.¹²⁰ The primary purpose of these maps, however, is “for broad, nationwide comparisons,” rather than for identifying specific regions that face heightened risk of natural disasters to apply appropriate standards for building codes and other land use.¹²¹

115. See Kimiko Barrett, *Reducing Wildfire Risk in the Wildland-Urban Interface: Policy, Trends, and Solutions*, 55 IDAHO. L. REV. 3, 5 (2019) (explaining that “better land use planning can work in tandem with suppression efforts and other mitigation measures to reduce wildfire risk to homes and communities”).

116. See Keiter, *supra* note 71, at 100 (arguing that the “adaptive strategies required to protect communities, sustain ecosystems, and safeguard resources . . . must address both the growing fuel-load concern and WUI zone expansion problem”).

117. See Steelman & Burke, *supra* note 97, at 67 (noting that because “suppression and hazardous fuels reduction receive greater attention and resources relative to ecosystem restoration and community assistance,” this represents “an incomplete solution to mitigating the long-term risk of wildfire, thereby running the risk of perpetuating it”).

118. *US Natural Hazards Index*, COLUM. CLIMATE SCH. NAT’L CTR. FOR DISASTER PREPAREDNESS, <https://ncdp.columbia.edu/us-natural-hazards-index> [<https://perma.cc/JXF7-B8HM>] (explaining that “[k]nowing which hazards exist where you live . . . increases your situational understanding to inform and tailor” a preparedness or mitigation plan for communities).

119. See *infra* note 122 (noting the significance of land use planning and mapping).

120. See Community Disaster Resilience Zones and the National Risk Index, 89 Fed. Reg. 95801, 95802 (Dec. 3, 2024) (explaining that the NRI “is a publicly available dataset and online mapping application that identifies the U.S. communities most at risk for 18 different natural hazards,” which “visualizes natural hazard risk metrics and includes important data about expected annual loss, social vulnerability, and community resilience”).

121. FEMA, NATIONAL RISK INDEX: TECHNICAL DOCUMENTATION 3-7 (2025), <https://www.fema>.

Mapping natural disaster risk enables decision-makers—local governments, developers, and homeowners—to prioritize mitigation strategies or even deter development in hazardous zones.¹²² Existing floodplain and seismic hazard mapping programs illustrate how federal incentive programs can contribute to the adoption of such mitigation strategies. Although “building codes mostly fall under the purview of state and local governments,”¹²³ compliance with heightened building standards is linked to a federal incentive program for floodplains, unlike for earthquakes.¹²⁴ Although a greater proportion of at-risk jurisdictions have *adopted* the most current seismic building codes when compared with at-risk floodplain jurisdictions,¹²⁵ “enforcement [of seismic building codes] is seldom acceptable.”¹²⁶ Adoption and enforcement of seismic building codes have been “uneven across and within states, even in areas with high levels of seismic hazard.”¹²⁷ By contrast, for “regulations [to] be legally-enforceable” in floodplains, they must be “applied uniformly through the community,” meaning that communities must adopt and enforce uniform regulations to be “eligible for federal flood mitigation assistance.”¹²⁸ This section argues that the floodplain management model offers a more effective framework than the seismic model, largely due to its federal incentive structure. Indeed, the coordination of federal hazard mapping with incentives

gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf [https://perma.cc/2XQK-NHU4].

122. See Wendy S.A. Saunders & Margaret Kilvington, *Innovative Land Use Planning for Natural Hazard Risk Reduction: A Consequence-Driven Approach from New Zealand*, 18 INT’L J. DISASTER RISK REDUCTION 244, 244 (2016) (“Land use planning is a major tool for reducing risks from natural hazards, in turn aiding sustainability and increasing resilience.”).

123. *Understanding Building Codes*, NAT’L INST. OF STANDARDS & TECH. (June 21, 2022), <https://www.nist.gov/buildings-construction/understanding-building-codes> [https://perma.cc/LM2T-T6CJ].

124. See *Seismic Building Codes*, FEMA, <https://www.fema.gov/emergency-managers/risk-management/earthquake/seismic-building-codes> [https://perma.cc/XT8W-2TVL] (last updated May 23, 2023) (“For the most part, code enforcement is the responsibility of local government building officials who review design plans, inspect construction work and issue building and occupancy permits.”).

125. *Building Code Adoption Tracking (BCAT)*, FEMA, <https://www.fema.gov/emergency-managers/risk-management/building-science/bcat> [https://perma.cc/XKB6-HNUY] (last updated July 15, 2025) (comparing 63 percent adherence in jurisdictions at risk of seismic activity, with just 45 percent in jurisdictions at risk of flooding).

126. EARTHQUAKE ENG’G RESEARCH INST., PROMOTING THE ADOPTION AND ENFORCEMENT OF EFFECTIVE BUILDING CODES WITH EARTHQUAKE PROVISIONS IN THE UNITED STATES 1 (2019) [hereinafter PROMOTING EFFECTIVE BUILDING CODES], <https://www.eeri.org/images/policy/Adopt-Building-Codes-White-Paper-12.10.19-v2.pdf> [https://perma.cc/D6TL-PEWA].

127. *Seismic Building Codes*, *supra* note 124.

128. Jesse J. Richardson Jr., *The National Flood Insurance Program as an Incentive To Employ Multiple Regulatory Approaches To Manage Floodplains: Lessons Learned from Pennsylvania, Vermont and West Virginia*, 115 ENV’T SCI. & POL’Y 8, 9 (2021).

for state and local adoption and enforcement of enhanced building codes provides a model for improving wildfire hazard mapping and mitigation.

A. Case Study: Mapping Floodplains and Federal Economic Incentives

Mapping natural disaster risk predates the establishment of FEMA.¹²⁹ In 1955, following a series of devastating hurricanes in the Northeast, Congress enlisted the Corps of Engineers to secure “data on the behavior and frequency of hurricanes” with a particular interest in surveying possible mitigation measures, such as warning services, dams, and other structures.¹³⁰ Not long after, Congress enacted the National Flood Insurance Act of 1968, which established the National Flood Insurance Program (“NFIP”).¹³¹ The NFIP provides federally subsidized flood insurance to homeowners in high-flood risk areas so long as the homeowners adhere to strict zoning and building requirements.¹³² The purpose of adopting the NFIP was twofold. First, the program would offer insurance to homeowners who had increasingly limited options to securing home insurance. And second, the program was intended to reduce the nation’s “*comprehensive* flood risk” with the establishment of “floodplain management standards.”¹³³

As part of the NFIP, FEMA maps floodplains to “signal to homeowners the flood risk of their property” by setting corresponding insurance premiums for each property.¹³⁴ Homeowners participating in the NFIP must then adhere to minimum requirements related to zoning, floodplain ordinances, and building codes.¹³⁵ In return, they receive subsidized home

129. See Exec. Order No. 12127, 44 Fed. Reg. 19367 (Mar. 31, 1979) (discussing how President Jimmy Carter established FEMA by executive order in 1979, thereby consolidating several existing federal emergency-related programs).

130. Act of June 15, 1955, Pub. L. No. 84-71, 69 Stat. 132 (authorizing an examination of coastal and tidal areas of the United States).

131. Title XII of the Housing and Urban Development Act of 1968, Pub. L. No. 90-448, 82 Stat. 476 (1968).

132. See *Flood Insurance*, FEMA, <https://www.fema.gov/flood-insurance> [<https://perma.cc/H2G2-7V8T>] (last updated July 1, 2025) (describing the program as one that provides flood insurance in communities that are then “required to adopt and enforce floodplain management regulations that help mitigate flooding effects”).

133. DIANE P. HORN, BAIRD WEBEL & JARED BROWN, CONG. RSCH. SERV., R44593, INTRODUCTION TO THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP) 2 (2024) (emphasis added).

134. U.S. GOV’T ACCOUNTABILITY OFF., FLOOD INSURANCE: FEMA’S NEW RATE-SETTING METHODOLOGY IMPROVES ACTUARIAL SOUNDNESS BUT HIGHLIGHTS NEED FOR BROADER PROGRAM REFORM 2 (2023), <https://www.gao.gov/assets/gao-23-105977.pdf> [<https://perma.cc/5M9D-ATH3>].

135. Request for Information on the National Flood Insurance Program’s Floodplain Management Standards, 86 Fed. Reg. 56713 (Oct. 12, 2021).

insurance.¹³⁶ Some states make participation mandatory if a property falls within a flood-prone region, though participation by local communities is typically voluntary.¹³⁷ One review of the program found that “63 percent of buildings are fully compliant with the NFIP and that 89 percent of the buildings are properly elevated, the most important factor in preventing flood damage.”¹³⁸ This program is not without problems. By virtue of the program providing a subsidy, “the premiums collected are not sufficient to cover flood claims, and the deficit is passed on to the Treasury Department.”¹³⁹ Accordingly, some argue that the NFIP “encourages irresponsible behavior by subsidizing the costs of building and rebuilding in locations that will continue to flood repeatedly.”¹⁴⁰ The current aggregate deficit of the program is more than \$20 billion.¹⁴¹

Notwithstanding the NFIP’s financial deficit, the heightened building standards that it triggers save approximately 786,000 buildings each year from flooding, leading to about \$484 million in avoided costs annually.¹⁴² FEMA has collected data following hurricanes to track the efficacy of the model building codes. In one study, FEMA reported that homes built in accordance with the NFIP building codes “reduced average claim payments by almost half.”¹⁴³ The NFIP can serve as a model for how Congress can assume “land-use planning control in communities that participate in the

136. See Horn, *supra* note 133 (describing that “Congress . . . directed FEMA to subsidize flood insurance” for certain properties).

137. NAT’L FLOOD INS. PROGRAM, FEMA, ANSWERS TO QUESTIONS ABOUT THE NFIP 9 (2023), <https://agents.floodsmart.gov/sites/default/files/media/document/2025-07/fema-answers-to-questions-about-nfip-brochure-06-2023.pdf> [<https://perma.cc/8A3T-3Y2K>].

138. JACQUELYN MONDAY, KRISTEN Y. GRILL, PAUL ESFORMES, MATTHEW ENG, TINA KINNEY & MARC SHAPIRO, AM. INST. FOR RSCH., AN EVALUATION OF COMPLIANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM PART A: ACHIEVING COMMUNITY COMPLIANCE, at x (2006), https://biotech.law.lsu.edu/disasters/insurance/nfip_eval_community_compliance_a.pdf [<https://perma.cc/DQD9-ECMF>].

139. Omri Ben-Shahar & Kyle D. Logue, *The Perverse Effects of Subsidized Weather Insurance*, 68 STAN. L. REV. 571, 587 (2016).

140. Benjamin Reilly, *Free Riders on the Firestorm: How Shifting the Costs of Wildfire Management to Residents of the Wildland-Urban Interface Will Benefit Our Public Forests*, 42 B.C. ENV’T. AFFS. L. REV. 541, 556–57 (2015).

141. *NFIP Debt*, FEMA, <https://www.fema.gov/case-study/nfip-debt> [<https://perma.cc/GB8Q-KU9Q>] (last updated Nov. 4, 2022).

142. FEMA, BUILDING CODES SAVE: A NATIONWIDE STUDY 7-4 (2020) [hereinafter FEMA, BUILDING CODES SAVE], https://www.fema.gov/sites/default/files/documents/fema_rsl_building-codes-save-study_042025.pdf [<https://perma.cc/UV6Z-BA5Q>].

143. *Codes Save*, INT’L CODE COUNCIL, <https://www.iccsafe.org/codessave> [<https://perma.cc/KC4P-39A4>] (noting that homes built in accordance with ICC’s most modern code “reduced the average claim payments by an additional 90%”).

NFIP.”¹⁴⁴ This incentive-based program, though not without its shortcomings, demonstrates how the coupling of federal mapping and incentive programs can encourage safer development in regions prone to natural disasters.

B. Case Study: Mapping Earthquake Risk Without Federal Economic Incentives

Although Congress has taken an active role in floodplain mitigation through FEMA, its approach to other natural disasters has been more passive. For example, FEMA maps other natural disasters, such as earthquakes,¹⁴⁵ but the onus is on states to respond accordingly to expected risk. In 1977, to reduce the risk of loss of life and property, Congress passed the Earthquake Hazards Reduction Act, requiring the United States Geological Survey (“USGS”) to “conduct a systematic assessment of the seismic risks in each region of the Nation prone to earthquakes.”¹⁴⁶ The purpose of this assessment was to develop “model building and planning codes” “in conjunction with State and local officials.”¹⁴⁷ Since the Earthquake Hazards Reduction Act’s passage, USGS has, in partnership with FEMA, used the hazard maps to publish “improv[ed] national seismic design standards and model building codes.”¹⁴⁸ Unlike for structures in floodplains through the NFIP, there is no mechanism for the federal government to mandate earthquake insurance for most buildings.¹⁴⁹ That said, the development of the building codes as a result of the USGS survey has been used by several states to require developers to build in accordance with applicable earthquake codes.¹⁵⁰

In 1990, for example, California responded with its own mapping of earthquake-prone regions, requiring that “all affected cities, counties, and state agencies” account for high-risk regions when “planning and controlling

144. Reilly, *supra* note 140, at 556 (“For example, FEMA must approve a community’s building code regulations before it can enter the program, thus allowing its residents procure flood insurance.”).

145. *Earthquake Hazard Maps*, FEMA, <https://www.fema.gov/emergency-managers/risk-management/earthquake/hazard-maps> [<https://perma.cc/BY2W-39T4>] (last updated Aug. 3, 2020).

146. Earthquake Hazards Reduction Act of 1977, Pub. L. No. 95-124, 91 Stat. 1098 (codified as amended at 42 U.S.C. §§ 7701–7708).

147. *Id.*

148. FEMA, SEISMIC BUILDING CODES IN THE U.S. 1 (2021), https://www.fema.gov/sites/default/files/documents/fema_NEHRP-35-year-retrospective-brochure-booklet_02-17-2021.pdf [<https://perma.cc/7XVA-ZHUE>].

149. See *Seismic Building Codes*, *supra* note 124 (explaining that some state and local jurisdictions have adopted earthquake measures in this area without mentioning federal laws).

150. See *id.* (“Rather than create and maintain their own codes, most states and local jurisdictions adopt the model building codes maintained by the International Code Council (ICC).”).

construction and development.”¹⁵¹ This requirement, known as the California Building Code, is “a state-wide building code that must be adopted by all jurisdictions” at a minimum but may be modified by local governments to meet specific needs.¹⁵² Other seismically active states, including Washington, also rely on hazard maps to guide residential construction and local decision-making.¹⁵³ Although several other states have adopted similar codes, “the adoption of modern, effective building codes with earthquake provisions has been uneven across the country and within individual states.”¹⁵⁴ In part, this failure is because several seismically-active states have permitted exemptions to the codes,¹⁵⁵ but it is also attributed to the fact that the implementation of earthquake building codes falls almost entirely upon local governments.¹⁵⁶

One consequence of this lack of uniform building codes for many high-risk states has been patchy implementation. In Alaska—“one of the most seismically active areas of the world”¹⁵⁷—the city of Anchorage experienced a devastating magnitude 7.1 earthquake in 2018.¹⁵⁸ Because the “building code coverage around the state [was] uneven and enforcement [was] spotty,”¹⁵⁹ most of the severe damage to buildings in Anchorage was largely in areas without code enforcement.

151. *California Seismic Hazard Zones*, CAL. DEP’T CONSERVATION, <https://www.conservation.ca.gov/cgs/sh/seismic-hazard-zones> [<https://perma.cc/TWN4-CTFM>].

152. *Protect Your Home from Earthquakes: Understanding California’s Seismic Building Codes*, CAL. RESIDENTIAL MITIGATION PROGRAM, <https://www.californioresidentialmitigationprogram.com/resources/blog/california-residential-seismic-building-codes-and-ordinances> [<https://perma.cc/6XC3-GKSL>].

153. *See Earthquakes and Faults*, WASH. STATE DEP’T NAT. RES., <https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/earthquakes-and-faults#what-we-do> [<https://perma.cc/7HQF-8MVV>] (“The maps are used by state and local governments to develop and update hazard-mitigation and response plans, and to mark geologically hazardous areas.”).

154. PROMOTING EFFECTIVE BUILDING CODES, *supra* note 126, at 1.

155. *See Seismic Building Codes*, *supra* note 124 (“Some states and local jurisdictions have adopted the codes but have made amendments or exclusions relating to the seismic provisions.”).

156. CAL. SEISMIC SAFETY COMM’N, GUIDE TO IDENTIFY & MANAGE SEISMIC RISKS OF BUILDINGS FOR LOCAL GOVERNMENTS 3 (2017), https://ssc.ca.gov/wp-content/uploads/sites/9/2020/08/cssc_seismic_risk_bldg_guide_exec_summ_final_mar_9_2017.pdf [<https://perma.cc/SBN2-QLHP>] (noting that “[s]tate agencies check plans for and inspect most mobile homes, public schools, hospitals and other essential services buildings,” while “[f]ederal agencies regulate building safety for federally owned buildings and support research to improve building standards”).

157. *Earthquake Risk in Alaska*, ALASKA SEISMIC HAZARDS SAFETY COMM’N, <https://seismic.alaska.gov/earthquake-risk.html> [<https://perma.cc/5TBL-SESF>].

158. Yereth Rosen, *In Seismically Active Alaska, Plans for Statewide Residential Building Codes Are on Shaky Ground*, ALASKA BEACON (Apr. 11, 2024, at 05:58 ET), <https://alaskabeacon.com/2024/04/11/in-seismically-active-alaska-plans-for-statewide-residential-building-codes-are-on-shaky-ground> [<https://perma.cc/3FZ3-CCVQ>].

159. *Id.*

As with development in wildfire-prone regions, the implementation of strict building codes for earthquakes is imperfect because local governments may be motivated by other concerns that eclipse a desire to build sound structures. Indeed, “long-term concerns [about development in high-hazard regions] have typically been outweighed by the demand for new homes, and the jobs and tax revenue that come with them.”¹⁶⁰ Before the earthquake in Alaska, for example, state legislators had introduced a bill that would require building codes for new developments.¹⁶¹ Detractors of these bills cited additional costs and delays to development, arguing that it can be time consuming to get the needed inspections done, thereby adding to the cost of development.¹⁶² Just as with fire-safe building codes, however, the adoption of seismic codes saves money in the long-term. Every dollar spent on seismic retrofitting yields up to twelve dollars in savings in the long-run.¹⁶³ Although retrofitting can be costly,¹⁶⁴ federal grant programs can ease local concerns surrounding these perceived costs, and further incentivize safer development in high-risk regions that would otherwise be averse to adopting such measures.

C. Improving Existing Wildfire Maps

As a starting point, Congress must improve its maps for natural disasters. Despite the federal government’s history of mapping floodplains,¹⁶⁵ FEMA’s current maps “under-represent the *actual* risks of flooding” in part because they do not account for rising sea levels and climate

160. Christopher Flavelle, *Americans Back Tough Limits on Building in Fire and Flood Zones*, N.Y. TIMES (Sept. 4, 2020), <https://www.nytimes.com/2020/09/04/climate/flood-fire-building-restrictions.html> [<https://perma.cc/9JL6-3X2F>].

161. See Rosen, *supra* note 158 (“Two bills pending in the Alaska Legislature . . . would create . . . statewide residential building codes. Both were introduced last year, but neither has made it to a floor vote. Both have run into headwinds at the committee level, to the frustration of supporters.”).

162. See *id.* (describing how one such detractor noted that such codes “will drive up the price of new construction, add construction delays while waiting for state inspectors, and lead to cost overruns”).

163. NAT’L INST. OF BLDG. SCIS., MITIGATION SAVES: SEISMIC RETROFIT OF BUILDINGS SAVES \$13 FOR EVERY \$1 (2019), https://nibs.org/wp-content/uploads/2025/04/ms_v3_retrofit_earthquake.pdf [<https://perma.cc/WUQ2-JX95>].

164. *Do-it-Yourself Retrofit Tips*, CAL. EARTHQUAKE AUTH., <https://www.earthquakeauthority.com/prepare-your-house-earthquake-risk/brace-and-bolt-grants/cea-policyholder-brace-bolt-grants/homeowner-resources/do-it-yourself-tips> [<https://perma.cc/T2A2-KJNE>] (“A typical retrofit completed by a licensed contractor may cost between \$3,000 and \$7,000 . . .”).

165. See *Wildfire Risk Index Explained*, *supra* note 46 (explaining that, beginning in 2016, FEMA started analyzing county-level data nationally for eighteen natural disasters, including wildfires, to create the NRI).

change.¹⁶⁶ Similarly, FEMA’s maps of county-level data for wildfires through the NRI identify “a community’s *relative* risk for Wildfires when compared to the rest of the United States.”¹⁶⁷ To establish this relative risk, the NRI considers the following three factors: exposure, frequency, and historic loss ratio.¹⁶⁸ Exposure assesses both the total value of the community’s buildings in dollars and the number of people at risk.¹⁶⁹ Frequency, meanwhile, estimates the number of wildfires that will take place in the area each year, and the historic loss ratio predicts the extent of damage a wildfire may cause to a community’s people and buildings.¹⁷⁰ As a program evaluating only relative risk, rather than considering a region’s actual conditions and the potential effects of climate change, the resulting NRI is overbroad and imprecise. Indeed, “many veteran emergency managers and planners see only limited, if any, utility in it” because it is “burdened with structural flaws . . . and ignorance of actual conditions on the ground.”¹⁷¹

For a comparison, the mapping system used by the California state government—Cal Fire’s FHSZ maps—is “based on fuel loading, slope, fire weather, and other relevant factors present, including areas where winds have been identified by the department as a major cause of wildfire spread.”¹⁷² These maps also consider fire history, and assign a hazard score of either moderate, high, or very high fire hazard.¹⁷³ Unlike the Cal Fire model, the NRI does not assess the physical surroundings of a community, including its weather patterns, potential fire behavior, nor proximity to highly flammable terrain, to determine fire risk. FEMA acknowledges that “most available wildfire hazard and risk maps are not explicitly designed to inform land-use planning, zoning, building design codes . . . or other wildfire resiliency construction practices at the local . . . scale.”¹⁷⁴ Consequently, most states have either “limited or no available wildfire hazard and risk maps

166. Rob Moore, *Accurate Flood Maps Are Essential for Climate Adaptation*, NAT. RES. DEF. COUNCIL (May 15, 2024) (emphasis in original), <https://www.nrdc.org/bio/rob-moore/accurate-flood-maps-are-essential-climate-adaptation> [<https://perma.cc/RN6C-4LGB>].

167. *Wildfire*, *supra* note 47 (emphasis added).

168. *Wildfire Risk Index Explained*, *supra* note 46.

169. *See id.* (“*Wildfire exposure* quantifies a community’s building value (in USD) and population (both the number of people and the population density) who are at risk of experiencing a wildfire.” (emphasis in original)).

170. *See id.* (“*Wildfire annualized frequency* estimates the number of wildfires that will take place in the community per year,” and “[t]he wildfire *historic loss ratio* projects the percentage of buildings or population that is expected to be lost in a wildfire.” (emphasis in original)).

171. Scigliano, *supra* note 51.

172. CAL. PUB. RES. CODE § 4202 (West 2024).

173. *Fire Hazard Severity Zones*, *supra* note 11 (qualifying that these maps do *not* consider “mitigation measures such as home hardening, recent wildfire, or fuel reduction efforts”).

174. MARSHALL FIRE MITIGATION ASSESSMENT, *supra* note 44, at 2.

to trigger planning and building safety provisions,” leading to development in high-hazard regions without appropriate mitigation measures.¹⁷⁵ A better mapping system, therefore, must more accurately reflect wildfire hazard for a building or housing development, rather than relying exclusively on historical data. Although historical data can be relevant, it is critical to also assess the changes in population and the physical surroundings of a development as well as how climate change may exacerbate potential fire behavior.

While California has developed a robust mapping system, other high-risk states have failed to develop comparable mapping systems, often due to insufficient funding.¹⁷⁶ Colorado, for example, maintained a wildfire risk map “so inaccurate that state officials all but ignored it,” until the state dedicated \$480,000 to update these maps in 2023.¹⁷⁷ Keeping current with the influx of people moving into WUI zones and the effects of climate change requires constant updates, yet “the majority [of states] do not have a reliable funding stream dedicated to keeping their data up to date.”¹⁷⁸ Wyoming also developed “a wildfire risk assessment portal” in 2018, but because funding is generally directed at fighting fires rather than efforts to prevent them, the agency responsible for the portal remains underfunded.¹⁷⁹ Since its inception, and as of January 2024, the portal has never been updated.¹⁸⁰

The inability of high-risk states to either develop or maintain current wildfire maps—“even as global warming increases the danger[] because of funding constraints”—presents an opportunity for federal intervention.¹⁸¹ The legislation mandating the development of the NRI is the Community Disaster Resilience Zones Act of 2022 (“the CDRZ Act”).¹⁸² The CDRZ Act

175. *Id.* at 3.

176. Avery Ellfeldt, *How Current Is That Wildfire Risk Map? Depends on the State*, E&E NEWS (Jan. 8, 2024, at 06:09 EST) [hereinafter Ellfeldt, *How Current Is That Wildfire Risk Map?*], <https://www.eenews.net/articles/how-current-is-that-wildfire-risk-map-depends-on-the-state> [https://perma.cc/3BT9-66F2] (“Limited funding has made it hard for states to keep their wildfire risk maps up to date, even as global warming increases the danger.”).

177. Avery Ellfeldt, *Wildfire Risk Maps Haven’t Kept Up with Wildfire Risks*, SCI. AM. (Jan. 9, 2024) [hereinafter Ellfeldt, *Wildfire Risk Maps*], <https://www.scientificamerican.com/article/wildfire-risk-maps-havent-kept-up-with-wildfire-risks> [https://perma.cc/VR64-G62P].

178. Ellfeldt, *How Current Is That Wildfire Risk Map?*, *supra* note 176 (“While most states have received state or federal dollars at some point to create a mapping tool and maybe even update it, the majority do not have a reliable funding stream dedicated to keeping their data up to date.”).

179. *Id.* (“[T]he agency is underfunded and . . . the dollars it does receive are generally dedicated to fighting fires, not preventing them.”).

180. *Id.*

181. Ellfeldt, *Wildfire Risk Maps*, *supra* note 177.

182. 42 U.S.C. § 5121 note (2022).

requires the President to “continue to maintain a natural hazard assessment program that develops and maintains products that . . . are available to the public” and “define natural hazard risk across the United States.”¹⁸³ The language of the CDRZ Act is permissive enough to modify the existing program from one that is developed exclusively by FEMA to one that delegates responsibility of mapping efforts from the federal government to the states, so long as the resulting maps remain “available to the public.”¹⁸⁴

Although FEMA does not indicate how much is spent on the development of the NRI each year, the agency spends about two hundred million dollars annually mapping and managing floodplains.¹⁸⁵ Mapping wildfires also merits such an investment. After all, flooding causes damages somewhere between \$179 billion to \$496 billion on average in the United States,¹⁸⁶ whereas wildfires cause between \$394 billion to \$893 billion each year.¹⁸⁷ FEMA should therefore provide the necessary funding for states and local governments to complete the development of these mapping systems. Because many states often lack the funding to develop their own hazard mapping systems, collaboration with FEMA would offer the resources to ensure their development. Under such a program, FEMA could retain primary responsibility for ensuring the maps are completed pursuant to the CDRZ Act yet benefit from the expertise of local partners to develop the maps.

Already, FEMA collaborates with both state and local governments, and partners in academia to develop the NRI.¹⁸⁸ States that have existing mapping programs often also partner with experts from local universities to develop their maps. Oregon, for example, partnered with wildfire scientists

183. *Id.* § 5136.

184. *See id.* (noting that the CDRZ Act is phrased such that responsibility of mapping efforts need not lie with any particular agency, so long as the resulting product is made available to the public).

185. DEP’T OF HOMELAND SEC., FEDERAL EMERGENCY MANAGEMENT AGENCY BUDGET OVERVIEW: FISCAL YEAR 2023 CONGRESSIONAL JUSTIFICATION 7 (2022), https://www.dhs.gov/sites/default/files/2022-03/Federal%20Emergency%20Management%20Agency_Remediated.pdf [<https://perma.cc/76WV-86GX>].

186. *Flooding Costs the U.S. Between \$179.8 and \$496.0 Billion Each Year*, U.S. CONG. JOINT ECON. COMM. (June 10, 2024), <https://www.jec.senate.gov/public/index.cfm/democrats/2024/6/flooding-costs-the-u-s-between-179-8-and-496-0-billion-each-year> [<https://perma.cc/8JC5-7ZT5>].

187. *Climate-Exacerbated Wildfires Cost the U.S. Between \$394 to \$893 Billion Each Year in Economic Costs and Damages*, U.S. CONG. JOINT ECON. COMM. (Oct. 16, 2023), <https://www.jec.senate.gov/public/index.cfm/democrats/2023/10/climate-exacerbated-wildfires-cost-the-u-s-between-394-to-893-billion-each-year-in-economic-costs-and-damages> [<https://perma.cc/D688-3HGZ>].

188. *Frequently Asked Questions*, FEMA NAT’L RISK INDEX, <https://hazards.fema.gov/nri/frequently-asked-questions> [<https://perma.cc/PS6G-96NX>].

at Oregon State University to develop its mapping system.¹⁸⁹ In other high-risk states, such as Texas, universities have assumed the primary role of mapping wildfire risk.¹⁹⁰ Delegation of responsibility to local experts could therefore allow the NRI program to remain intact while benefitting from local experts who are better equipped to address and identify vulnerabilities within a community.

Delegation of responsibility to states, coupled with funding from FEMA, could also address the primary constraint to developing statewide mapping: funding.¹⁹¹ Although an annual investment of two hundred million dollars is unlikely to fund the immediate development of adequate maps nationally, this funding can be directed at states that are facing severe wildfire seasons, including Texas, North Carolina, Montana, and Washington.¹⁹² Although California has spent decades refining its FHSZ maps under an agency with a budget of nearly \$4 billion,¹⁹³ it took Colorado just \$480,000 to update its maps to better reflect current hazards.¹⁹⁴ An initial investment, therefore, can help develop risk assessments that evolve over time, providing local communities more accurate reflections of hazards—particularly in states that currently lack maps altogether. For that reason, FEMA should delegate responsibility of its wildfire mapping to states, which can leverage local experts in academia to develop useful and accurate maps of actual risk.

III. USING MAPPING TO IMPLEMENT ADEQUATE BUILDING CODES

Although mapping can enhance a community’s awareness of its risk of wildfire, effective wildfire risk mitigation must carry an enforcement mechanism so that individual developers or communities cannot side-step heightened building codes. Otherwise, communities like Folsom, California can continue to take advantage of loopholes, leaving residents vulnerable to

189. *Oregon Statewide Wildfire Hazard Map*, OR. ST. UNIV. COLL. OF FORESTRY, <https://hazardmap.forestry.oregonstate.edu> [<https://perma.cc/NWZ7-W9FW>].

190. See TEX. A&M FOREST SERV., <https://texaswildfirerisk.com> [<https://perma.cc/U2EY-A83C>] (providing resources for Texas residents to understand wildfire risk, including maps, without reference to collaboration with the state government).

191. See Ellfeldt, *How Current Is That Wildfire Risk Map?*, *supra* note 176 (“Limited funding has made it hard for states to keep their wildfire risk maps up to date.”).

192. See *Wildfires by State 2025*, WORLD POPULATION REV., <https://worldpopulationreview.com/state-rankings/wildfires-by-state> [<https://perma.cc/K654-RD7K>] (categorizing these states as among the “most dangerous” with regard to wildfire damage).

193. GABRIEL PETEK, LEGIS. ANALYST’S OFF., THE 2023-24 BUDGET: CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION’S MAJOR CAPITAL OUTLAY PROPOSALS 1 (2023), <https://lao.ca.gov/reports/2023/4693/CA-Dept-Forestry-Fire-Protection-022123.pdf> [<https://perma.cc/EQS4-JPUN>].

194. Ellfeldt, *Wildfire Risk Maps*, *supra* note 177.

fire hazard.¹⁹⁵ Notwithstanding the importance of developing hazard-resistant building codes on a national level, the role of the federal government is limited in setting building codes because “the regulation of construction is a state right.”¹⁹⁶ Often, a state’s authority to regulate land use through zoning is still further delegated to local governments.¹⁹⁷ Therefore, local governments have the responsibility to “review construction plans, issue building permits and inspect construction for more than 90 percent of buildings.”¹⁹⁸ The result is often inadequate adoption: A 2020 FEMA study found that 65 percent of counties, cities, and towns across the country had not adopted the most current fire-resistant building codes.¹⁹⁹

This deficit can be attributed in part to the fact that many states do not have wildfire hazard maps to identify at-risk regions.²⁰⁰ An additional challenge, however, is that local governments must often weigh the hazard of construction in high-risk regions against the value of added revenue collected from property taxes.²⁰¹ Weighing risk against cost is further amplified by the perception that implementing fire-safe building codes will lead to additional development expenses.²⁰² Although “no study has reliably

195. See *supra* note 39 and accompanying text (discussing how “[m]ushrooming cities such as Folsom, where an 11,000-home development is springing up, have the ability to bypass the state’s safety standards in spite of considerable fire risks”).

196. FEMA, BUILDING CODES TOOLKIT (2023), https://www.fema.gov/sites/default/files/document/s/fema_building-codes-toolkit.pdf [https://perma.cc/92J4-TS9U]; see also *New York v. United States*, 505 U.S. 144, 188 (1992) (“The Federal Government may not compel the States to enact or administer a federal regulatory program.”).

197. DIANE P. HORN & ERICA A. LEE, CONG. RSCH. SERV., R47612, BUILDING RESILIENCE: FEMA’S BUILDING CODES POLICIES AND CONSIDERATIONS FOR CONGRESS 9 (2023), <https://crsreports.congress.gov/product/pdf/R/R47612> [https://perma.cc/K66D-DNPU].

198. CAL. SEISMIC SAFETY COMM’N, *supra* note 156, at 3.

199. FEMA, PROTECTING COMMUNITIES AND SAVING MONEY: THE CASE FOR ADOPTING BUILDING CODES 3 (2020), https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_brochure.pdf [https://perma.cc/CGJ3-D5FC] (“The people living in those places are bearing a dangerous, costly, and unnecessarily high level of risk in the face of natural disasters.”).

200. MARSHALL FIRE MITIGATION ASSESSMENT, *supra* note 44, at 3.

201. One author wrote on this topic that

there’s little clear incentive for local officials to prevent the construction of new homes, even ones that will increase the risk for the entire community. One more flammable structure on the hillside, one or two more cars on the road—but also revenue collected from one more property tax bill.

Susie Cagle, *The Quest To Build Wildfire-Resistant Homes*, MIT TECH. REV. (Apr. 18, 2023), <https://www.technologyreview.com/2023/04/18/1071274/climate-change-building-fire-resistant-homes-adaptation/> [https://perma.cc/4H5W-P4VR].

202. *Building Codes Save Money and Lives*, SCI. AM. (Aug. 24, 2023), <https://www.scientificamerican.com/article/building-codes-save-money-and-lives> [https://perma.cc/4XDR-SPSF] (noting that “[h]omebuilders and policymakers have raised concerns that stronger codes would raise home prices”).

shown that [stronger codes raise home prices],”²⁰³ more must be done to tip the scales in favor of mitigation measures.

Here, too, FEMA can play a role in incentivizing state and local governments to enact stricter zoning and building codes. After all, Congress has granted FEMA statutory authority to “provide funding to states and localities to adopt and enforce hazard-resilient building codes . . . and restrict federal funding to rebuild in certain hazard-prone areas.”²⁰⁴ Because both actual and perceived costs of enacting codes often sway local governments away from enacting stricter codes,²⁰⁵ FEMA can use its existing funding programs to support financially constrained local decision-makers. Already, FEMA provides several streams of funding to communities both before and after natural disasters, though the bulk of this funding is directed at helping communities *after* a natural disaster strikes.²⁰⁶ As climate change continues to amplify the risks and frequency of natural disasters, this post-hoc funding strategy will become increasingly untenable.

In 2024, for example, following a series of devastating hurricanes, wildfires, and tornadoes, FEMA prematurely exhausted its nearly \$40 billion annual budget before the end of its fiscal year, forcing Congress to open the agency’s 2025 budget to fund the agency.²⁰⁷ In the span of eight days in October 2024, following Hurricanes Helene and Milton, the agency spent nearly half of its annual budget.²⁰⁸ As years like 2024, dubbed a “nonstop disaster year,”²⁰⁹ continue to be a global reality, an approach that focuses primarily on aiding communities after disaster strikes will not only become exceedingly expensive, but will also leave millions of people vulnerable to the effects of climate disasters. Climate change is an unavoidable reality that agencies such as FEMA must reckon with. Accordingly, FEMA should increase the share of funding dedicated to mitigation efforts in communities,

203. *Id.*

204. HORN & LEE, *supra* note 197.

205. See Kasler & Sabalow, *supra* note 22 (describing how Coffey Park officials opted not to require heightened building codes for residents rebuilding after the 2017 Tubbs Fire partly because of concerns that reconstruction would be too expensive).

206. *2023 in Numbers*, FEMA, <https://www.fema.gov/blog/2023-numbers> [<https://perma.cc/TT4D-83QA>] (last updated Jan. 21, 2025) (explaining that in 2023, more than \$13 billion was spent on aid after disaster, whereas only \$3 billion was allocated to “grants building climate-resilient communities”).

207. Ella Nilsen, *How Did FEMA Spend \$9 Billion So Quickly? Back-to-Back Disasters*, CNN (Oct. 10, 2024, at 14:37 EDT), <https://www.cnn.com/2024/10/10/politics/fema-disaster-funding-congress-explainer/index.html> [<https://perma.cc/5MAA-5MVH>].

208. Thomas Frank & Anne C. Mulkern, *FEMA Spent Nearly Half Its Disaster Budget in Just 8 Days*, POLITICO (Oct. 10, 2024, at 10:48 EDT), <https://www.politico.com/news/2024/10/10/fema-disaster-budget-hurricane-helene-melton-00183219> [<https://perma.cc/B3HW-XC4N>].

209. Nilsen, *supra* note 207.

particularly those at risk of wildfire, rather than waiting until after disaster strikes. Although such an approach would require an upfront investment, the payoff in the event of a disaster would be enormous.²¹⁰ The following section will discuss how communities can implement fire-safe building and zoning codes and how FEMA can modify its existing grant programs to encourage state and local governments to enact stricter building codes.

A. The Efficacy of Fire Safe Development

The safest measure to reduce fire risk would be to prevent people from moving into WUI zones.²¹¹ Given the rapid development in WUI zones—a nearly 50 percent increase in the number of homes over the last thirty years²¹²—this proposal, however, is impractical.²¹³ As an alternative, homes built in WUI zones should be built to heightened, fire-resistant building codes. The features of a fire-resistant home include the use of flame-resistant materials in exterior walls, decks, and roofs.²¹⁴ The landscaping of the home should also ensure there is a defensible space around the property, meaning that the perimeter of the home is clear of flammable vegetation.²¹⁵ Although detractors of these measures argue that a home constructed with fire-resistant materials will cost more, a 2018 study found “negligible cost differences” between a home adhering to these design features and a home that does

210. See NAT'L INST. OF BLDG. SCIS., NATURAL HAZARD MITIGATION SAVES: 2017 INTERIM REPORT, at i (2017), https://www.preventionweb.net/files/56608_nibsmitigationsavesinterim.pdf?startDownload=true [<https://perma.cc/E3QV-8JUB>]. (“Pre-disaster mitigation—preparing in advance for future disasters—better assures that hazardous events will have short-lived and more manageable outcomes. Mitigation saves lives, preserves homes and belongings, reduces the need for temporary shelter; helps economies to spring back faster, and lowers recovery costs.”).

211. Kate Anderson, *The Best Wildfire Solution We're Not Using*, SIGHTLINE INST. (June 1, 2023), <https://www.sightline.org/2023/06/01/the-best-wildfire-solution-were-not-using> [<https://perma.cc/UK9Y-JT4S>] (“[T]he best and possibly only practical way to protect homes from fire is to stop building so many of them in places that are primed to burn.”).

212. See *Understanding the Wildland-Urban Interface (1990-2020)*, *supra* note 112 (illustrating the pervasiveness of homes in the WUI in 2020).

213. Ben Christopher, *Why California Keeps Putting Homes Where Fires Burn*, CALMATTERS (Jan. 16, 2025), <https://calmatters.org/housing/2025/01/ca-wui-housing-policy/> [<https://perma.cc/BU4S-AVSZ>] (“Some argue that California doesn't have the luxury not to build (and rebuild) in fire country . . . [because of the state's] chronic housing crisis caused by a severe shortage of homes.”).

214. FEMA, FIRE-RESISTANT MATERIALS AND ASSEMBLIES 3–5 (2025), https://www.fema.gov/sites/default/files/documents/fema_rsl_hi-ra-4-fire-resistant-materials-and-assemblies_042025.pdf [<https://perma.cc/59XR-W3XM>] (explaining that fire-resistant materials include cement, plaster, stucco, stone, brick, or concrete).

215. *Before a WUI Fire*, U.S. FIRE ADMIN., <https://www.usfa.fema.gov/wui/outreach/before-wui-fire.html> [<https://perma.cc/SJR5-DCY8>] (last updated May 23, 2023).

not.²¹⁶ With more than 30 percent of homes in the country within WUI zones—a proportion that is only expected to rise as more people move into these zones and as more land is classified as WUI due to warmer and drier conditions—it is critical that homes meet standards to increase their survivability during a fire.²¹⁷

Although a home cannot be feasibly built to withstand *any* fire, the efficacy of building to fire-resistant codes has been demonstrated in California, which adopted mandatory codes in 2008.²¹⁸ Prior to the adoption of these codes, California experienced two devastating wildfires: the Panorama Fire in 1980, which destroyed 286 homes, and killed four people,²¹⁹ and the Oakland Hills Fire in 1991, which destroyed more than 3,400 homes, and killed twenty-five people.²²⁰ In response to these deadly fires,²²¹ California directed Cal Fire to map fire risks in the state.²²² The resulting maps “attempt[ed] to predict the probability of a fire starting and the likelihood that it could become significant,” thus “spawn[ing] tighter building standards,” known as Chapter 7A.²²³ Chapter 7A establishes certain fire-resistant measures, including ignition-resistant materials for roofing, exterior coverings, vents, windows, doors, decking, and any accessory structures.²²⁴ After implementing Chapter 7A, “California leads the USA in

216. Kelly Pohl, *Building a Wildfire-Resistant Home: Codes and Costs*, HEADWATERS ECON. (Nov. 26, 2018), <https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes> [<https://perma.cc/7ZJD-ES5K>].

217. *Id.*

218. Bill Gabbert, *Data Shows Building Codes Can Reduce Vulnerability of Homes in Wildfires*, WILDFIRE TODAY (Jan. 30, 2022), <https://wildfiretoday.com/data-shows-building-codes-can-reduce-vulnerability-of-homes-in-wildfires/> [<https://perma.cc/PRU5-8R38>].

219. Nick Cataldo, *Remembering the Perils of the Panorama Fire After 40 Years*, SAN BERNARDINO SUN (Nov. 23, 2020, at 5:06 PST), <https://www.sbsun.com/2020/11/23/remembering-the-perils-of-the-panorama-fire-after-40-years> [<https://perma.cc/YZ82-AKJU>].

220. Stephanie Sierra, *31 Years Later, Oakland Hills Firestorm Victims Worry Lessons Learned Are Now ‘Forgotten’*, ABC7 NEWS (Oct. 20, 2022), <https://abc7news.com/oakland-hills-fire-1991-firestorm-east-bay-california-wildfire/12352991> [<https://perma.cc/4DY6-HC22>].

221. See *Fire Hazard Severity Zones*, *supra* note 11 (noting that the “Fire Hazard Severity Zone maps arose from major destructive fires, prompting the recognition of these areas and strategies to reduce wildfire risks”).

222. See CAL. PUB. RES. CODE §§ 4201–4204 (West 2022) (explaining that the purpose of the legislation was to classify land “in accordance with the severity of fire hazard present for the purpose of identifying measures to be taken to retard the rate of spreading and to reduce the potential intensity of uncontrolled fires that threaten to destroy resources, life, or property”).

223. Kasler & Reese, *Which Houses Survived Wildfire?*, *supra* note 39.

224. *Supra* notes 14–15 and accompanying text.

having a building code with the objective of limiting the impact of wildfires on the built environment.”²²⁵

Research shows that homes built in California according to these standards are “40% more likely to survive a major wildfire.”²²⁶ The state, however, need not rely on theoretical data to evaluate the efficacy of its building codes. Following the 2018 Camp Fire, which burned 153,000 acres and killed eighty-five people in Paradise, California,²²⁷ a study found that 51 percent of homes built in accordance with then-current fire codes survived, compared with only 18 percent of those that did not.²²⁸ Certainly, enhanced building codes cannot guarantee that a home will survive an extreme wildfire like the Camp Fire, but they can significantly improve the likelihood of its survival.

With disasters like the Camp Fire, other features of fire-safe development related to zoning become critical, including limiting housing density and establishing evacuation routes. The effect of housing density on a structure’s risk of ignition may seem paradoxical. Although homes that are in close proximity to one another are often at heightened risk due to embers blowing between homes,²²⁹ research has found that structure loss to wildfires occurs primarily at “fairly low housing densities.”²³⁰ In part, this is because remote housing is often further from emergency services, and more likely to go unnoticed for a longer period of time than if the fire occurred in a more densely-populated community.²³¹ The homes in these regions are also less

225. Eric E. Knapp, Yana S. Valachovic, Stephen L. Quarles & Nels G. Johnson, *Housing Arrangement and Vegetation Factors Associated with Single-Family Home Survival in the 2018 Camp Fire, California*, FIRE ECOLOGY, Oct. 4, 2021, at 1, 3.

226. Samantha Fields, *California’s Wildfire Building Codes Make Newer Homes Less Likely To Burn*, MARKETPLACE (Apr. 1, 2022), <https://www.marketplace.org/2022/04/01/californias-wildfire-build-ing-codes-make-newer-homes-less-likely-to-burn> [https://perma.cc/YMP7-YMPZ].

227. Hayley Smith & Alex Wigglesworth, *It’s Been 5 Years Since California’s Deadliest Wildfire. Can We Stop It from Happening Again?*, L.A. TIMES (Nov. 8, 2023), <https://www.latimes.com/environment/story/2023-11-08/its-been-5-years-since-californias-deadliest-wildfire-can-we-stop-it-from-happening-again> [https://perma.cc/9RJ2-4GG4].

228. Amanda Loudin, *When Wildfires Hit, Homes Built Under Fire-Resistant Codes Are Surviving. Communities Are Noticing*, SMART CITIES DIVE (June 16, 2023), <https://www.smartcitiesdive.com/news/fire-resistant-building-codes-homes-wildfires/653132> [https://perma.cc/6UXK-AGYD].

229. *How Density Impacts Community*, NAT’L INST. OF STANDARDS & TECH. (Aug. 29, 2023), <https://www.nist.gov/el/fire-research-division-73300/wildland-urban-interface-fire-73305/hazard-mitigation-methodology-19> [https://perma.cc/YB3Z-U6CC].

230. Alexandra D. Syphard, Heather Rustigian-Romsos, Michael Mann, Erin Conlisk, Max A. Moritz & David Ackerly, *The Relative Influence of Climate and Housing Development on Current and Projected Future Fire Patterns and Structure Loss Across Three California Landscapes*, 56 GLOB. ENV’T. CHANGE 41, 49 (2019).

231. FEMA, THE RURAL FIRE PROBLEM IN THE UNITED STATES 20 (1997), <https://www.usfa.fema.gov/downloads/pdf/statistics/rural.pdf> [https://perma.cc/9845-M8VS].

likely to be built in accordance with fire-safe construction, often made with “unprotected wood.”²³² Given that the loss of homes is most likely to occur in rural communities, local decision-makers must consider requirements for development in high-hazard, WUI zones. Although it is unrealistic to stop building in WUI zones,²³³ greater care must be paid to ensure communities in these regions adopt fire-safe construction methods, and communities should weigh the risk of further development with the hazards such development poses to its residents.

B. Incentivizing Safer Development

FEMA should use its existing pre-disaster mitigation funding to incentivize states to adopt fire-resistant building codes. FEMA has mechanisms to create incentive structures that promote safer development and provide opportunities for local communities to reduce risk in a natural disaster.²³⁴ Until 2020, FEMA funding for pre-disaster mitigation efforts, including dedicating support to ensuring compliance with building codes, was a fraction of what is today.²³⁵ In 2018, however, congressional focus shifted from post-disaster assistance to pre-disaster resilience efforts with the passage of the Disaster Recovery Reform Act, which dedicated funding to mitigation measures.²³⁶ Following the passage of the Disaster Recovery Reform Act, FEMA launched the Building Resilient Infrastructure and Communities (“BRIC”) grant program, which funds proactive investments in communities to “avoid economic losses from wildfire, floods, and other disasters.”²³⁷ In April 2025, the Trump administration ended the BRIC

232. *Id.*

233. See Thomas Lane, *Is It Time To Stop Building in the Wildfire Affected Areas of California?*, BUILDING (Jan. 24, 2025), <https://www.building.co.uk/comment/is-it-time-to-stop-building-in-the-wildfire-affected-areas-of-california/5133978.article> [<https://perma.cc/5XSZ-KVN7>] (“California has a severe housing shortage, which is driving development in these areas. As safer land is built out, cities are expanding into the riskier, surrounding hills.”).

234. *Hazard Mitigation Assistance Grants*, FEMA, <https://www.fema.gov/grants/mitigation> [<https://perma.cc/8W65-WNRJ>] (last updated May 22, 2025) (“FEMA’s hazard mitigation assistance provides funding for eligible long-term solutions that reduce the impact of disasters in the future.”).

235. DIANE P. HORN, CONG. RSCH. SERV., IN11733, RECENT FUNDING INCREASES FOR FEMA HAZARD MITIGATION ASSISTANCE 2 (2022) (explaining that funding rarely exceeded \$100 million between 1997 and 2019, yet, in 2022, funding reached nearly \$2.5 billion).

236. See *id.* (noting that post-disaster mitigation efforts received significantly more funding compared to pre-disaster mitigation until the passage of the Disaster Recovery Reform Act).

237. Kris Smith & Patricia Hernandez, *Rising Demand for FEMA’s BRIC Program Far Exceeds Available Funding*, HEADWATERS ECON. (July 30, 2024), <https://headwaterseconomics.org/natural-hazards/rising-demand-for-femas-bric-program-far-exceeds-available-funding> [<https://perma.cc/BD32-H93Y>].

program.²³⁸ Although the Trump administration called BRIC “wasteful,” local officials that relied on its funding instead characterized it as “a vital use of government resources to proactively protect lives, infrastructure and economies.”²³⁹ Since its inception in 2020, BRIC dispersed more than \$5 billion to mitigation efforts.²⁴⁰ Throughout its tenure, however, the demand for funding has outweighed BRIC’s available resources by more than 500 percent.²⁴¹ Moreover, as a source of funding for mitigating several types of natural disasters, the available funding for wildfires, specifically, was limited: as of 2022, only 7 percent of the projects selected for financing fell within the scope of wildfire management.²⁴²

Despite BRIC’s relatively limited funding for wildfire mitigation measures, the value of the program was the potential for its evaluation criteria to incentivize applicants—local and state governments—to adopt and enforce building codes. When reviewing applications for hazard mitigation proposals, the BRIC program relied on a point system to evaluate “how the project mitigates natural hazard risk” to structures, people, and the economy.²⁴³ Another factor that weighed significantly on a proposal’s success was whether the applicant had adopted and enforced building codes.²⁴⁴ To “nudge states to adopt and enforce building codes,” BRIC awarded more points to applicants that mandate and enforce building codes, thereby increasing the likelihood that the applicable state or community will receive FEMA funding.²⁴⁵

Nevertheless, North Carolina serves both as an example of BRIC’s imperfect incentive scheme and the importance of taking prophylactic

238. Press Release, U.S. Dep’t of Homeland Sec., FEMA Ends Wasteful, Politicized Grant Program, Returning Agency to Core Mission of Helping Americans Recovering from Natural Disasters (Apr. 4, 2025), <https://www.dhs.gov/news/2025/04/04/fema-ends-wasteful-grant-program> [<https://perma.cc/Y8NC-3EAN>] (“The BRIC program was yet another example of a wasteful and ineffective FEMA program. It was more concerned with political agendas than helping Americans affected by natural disasters.”).

239. Jack Brook, *Loss of FEMA Program Spells Disaster for Hundreds of Communities and Their Projects*, AP NEWS (Apr. 28, 2025, at 07:45 EDT), <https://apnews.com/article/fema-bric-grants-climate-resilience-cbbed8d418e1ff4e53d95f482de3522> [<https://perma.cc/J26F-UES2>].

240. Smith & Hernandez, *supra* note 237.

241. *See id.* (showing that in 2023, communities across the country requested approximately \$5.7 billion from BRIC, but only \$1 billion was made available to these communities).

242. WILDLAND FIRE MITIGATION & MGMT. COMM’N, *supra* note 68, at 36.

243. FEMA, BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES TECHNICAL EVALUATION CRITERIA 2 (2022), https://www.fema.gov/sites/default/files/documents/fema_fy22-bric-technical-evaluation-criteria-psm_112022.pdf [<https://perma.cc/9VJY-953W>].

244. *Id.* at 3.

245. Kevin Manuele & Mark Haggerty, *How FEMA Can Build Rural Resilience Through Disaster Preparedness*, CTR. FOR AM. PROGRESS (Oct. 6, 2022), <https://www.americanprogress.org/article/how-fema-can-build-rural-resilience-through-disaster-preparedness> [<https://perma.cc/TTQ5-ARJ6>].

measures in high-risk areas before natural disasters strike. In 2024, Hurricane Helene devastated western North Carolina, with estimates of damage reaching up to \$53 billion.²⁴⁶ In 2023, the state applied for \$20 million in BRIC funding to improve flood resilience in the state²⁴⁷ but was denied funding because it relies on out-of-date hurricane building codes.²⁴⁸ The decision not to adopt building codes that would have made construction safer is a failure of North Carolina’s legislature.²⁴⁹ Indeed, “North Carolina lawmakers and lobbyists weakened the state’s building code for years before Hurricane Helene hit.”²⁵⁰ The structure of BRIC’s funding, therefore, penalized states like North Carolina where lawmakers succumb to lobbying efforts from building associations, “who can profit more from cheap construction at the cost of homeowners.”²⁵¹ As a consequence of the state legislature failing to adopt new building codes, homeowners suffer: “Cutting corners and building homes that are less safe and less efficient only adds to the long-term costs of owning or renting a home in North Carolina.”²⁵²

Incentivizing safer development can be a valuable federal tool—by allocating billions of dollars to mitigation measures, BRIC and programs like it offer local communities an opportunity to reduce the potential impact of a natural disaster.²⁵³ Other programs, aimed exclusively at wildfire mitigation,

246. Gary D. Robertson, *North Carolina Government Calculates Hurricane Helene Damages, Needs at Least \$53B*, AP NEWS (Oct. 23, 2024, at 07:07 EDT), <https://apnews.com/article/north-carolina-hurricane-helene-damage-estimate-1c32acaf158bf17cae815926ea682c0e> [<https://perma.cc/J8XH-9HHC>].

247. Brandon Kingdollar, *Building Codes Led North Carolina To Lose Out on \$70M in Disaster Prep Funds, State Says*, NC NEWSLINE (Oct. 16, 2024, at 05:45 ET), <https://ncnewsline.com/2024/10/16/building-codes-led-north-carolina-to-lose-out-on-70m-in-disaster-prep-funds-state-says> [<https://perma.cc/86MS-4HYA>].

248. *See id.* (explaining that delays in adopting the most current building codes “put North Carolina behind most other coastal states vying for flood mitigation projects”).

249. David Hodges, *North Carolina Lawmakers Erode Building Code Years Before Helene Hit*, WBTV (Oct. 5, 2024, at 6:00 EDT), <https://www.wbvtv.com/2024/10/05/north-carolina-lawmakers-erode-building-code-years-before-helene-hit> [<https://perma.cc/T99M-5QS7>].

250. *Id.*

251. *See North Carolina Faces the Effects After Republican Legislators Blocked Resilient Building Codes, Losing Millions in FEMA Funding*, N.C. GOVERNOR’S OFF. (July 25, 2024), <https://governor.nc.gov/news/press-releases/2024/07/25/north-carolina-faces-effects-after-republican-legislators-blocked-resilient-building-codes-losing> [<https://perma.cc/9HGX-P9YY>] (arguing that the North Carolina legislature refused updates that would have matched state building standards with those of other states frequently impacted by severe weather).

252. Rob Moore, *Weaker Codes Means New Homes Will Be Less Safe in North Carolina*, NAT. RES. DEF. COUNCIL (May 22, 2024), <https://www.nrdc.org/bio/rob-moore/weaker-codes-means-new-homes-will-be-less-safe-north-carolina> [<https://perma.cc/2T3Q-NEFF>].

253. *See Anna Weber & Joel Scata, Outdated Building Codes Are Costly and Dangerous*, NAT. RES. DEF. COUNCIL (Aug. 26, 2024), <https://www.nrdc.org/bio/anna-weber/outdated-building-codes-are-costly-and-dangerous> [<https://perma.cc/F7TP-V7W5>] (“Incentivizing the development, adoption and

should also incentivize grant recipients to adopt fire-resistant building codes, just as BRIC had done. One such federal government aid program that focuses exclusively on wildfire mitigation measures is the Community Wildfire Defense Grant (“CWDG”) program, which has allocated \$1 billion for community planning and fuel reduction since 2021.²⁵⁴ Administered by the U.S. Forest Service, funding opportunities through the CWDG program are competitive, with fewer than 25 percent of applicants receiving funding during the program’s first round of funding.²⁵⁵ During the first year of the program, applicants requested roughly three times as much funding as was available.²⁵⁶

Just as the BRIC program was designed to support mitigation efforts by local communities, the CWDG program should also be expanded to administer funding for communities to develop safer construction. Currently, the program is not structured in a way that incentivizes the adoption of wildfire-safe building codes.²⁵⁷ Rather, the program dedicates its funding largely to developing local plans that engage community members and promote education of best wildfire practices.²⁵⁸ The CWDG program must make more funding available for direct mitigation and resilience measures, including for the adoption of fire-safe building codes and the regulation of flammable vegetation and evacuation routes. A recent FEMA study found that adopting modern building codes “save[d] \$11 for every dollar invested,” thereby “reduc[ing] the susceptibility of buildings to damage during a natural hazard event.”²⁵⁹ For wildfires, specifically, a recent study found that the

enforcement of modern, climate-resilient building codes will help prepare communities for the impacts of climate change . . . [by] increas[ing] protection and reduc[ing] damage costs . . .”).

254. ANNE A. RIDDLE, CONG. RSCH. SERV., R45219, FOREST SERVICE ASSISTANCE PROGRAMS 28 (2023).

255. Kelly Pohl, *Analysis of the First Round of Community Wildfire Defense Grants*, HEADWATERS ECON. (May 31, 2023), <https://headwaterseconomics.org/natural-hazards/cwdg-first-round> [<https://perma.cc/L8GP-5AMD>].

256. *Id.*

257. *See Community Wildfire Defense Grant Program*, U.S. FOREST SERV., <https://www.fs.usda.gov/managing-land/fire/grants/cwdg> [<https://perma.cc/AC74-P5DK>] (explaining that CWDG prioritizes communities that are “[1] In an area identified as having high or very high wildfire hazard potential, [2] Are low income or, [3] Have been impacted by a severe disaster within the previous 10 years which increased wildfire risk and/or hazard”).

258. *See* U.S. FOREST SERV., USDA FOREST SERVICE STATE AND PRIVATE FORESTRY FISCAL YEAR 2022 COMMUNITY WILDFIRE DEFENSE GRANT NOTICE OF FUNDING OPPORTUNITY INSTRUCTIONS 1 (2022) [hereinafter FEMA, USDA FOREST SERVICE FISCAL YEAR 2022], <https://www.fs.usda.gov/sites/default/files/2022-08/Instruction-CWSF-CWDG-NOFO.pdf> [<https://perma.cc/UD6Q-QMNW>] (“The purpose of the Community Wildfire Defense Grant is to assist at-risk local communities and Indian Tribes with planning for and mitigating against the risk created by wildfire.”).

259. FEMA, BUILDING CODES SAVE, *supra* note 142, at 8-1.

construction costs to develop a wildfire-resistant home are actually *cheaper* than to build a typical home.²⁶⁰ Accordingly, “the cost of constructing a home to meet wildfire-resistant building codes need not be a barrier” to enforcing stricter codes.²⁶¹

Although an expansion of the CWDG program beyond its current scope²⁶² would likely cost more, a broader investment now can ease the financial burden after a natural disaster. After all, in the last thirty years, the costs associated with fire suppression have tripled, now reaching nearly \$500 million annually.²⁶³ Because it is not realistic to forbid development in WUI zones, the choice, therefore, is to either “[r]educe wildfire risks or pay more for fire disasters.”²⁶⁴

CONCLUSION

As climate change continues to increase the likelihood of extreme natural disasters, federal aid efforts must shift their focus from funding primarily after disasters strike to instead preventing disaster in the first place, through enhanced mitigation and resilience measures.

Decades of fire suppression policies and the growth of WUI zones have only magnified the risk of extreme wildfire events. More must be done to identify hazardous regions so that local communities can enact stricter regulations to protect their residents. Such efforts have often proven politically unpopular at the local level, so the onus is on the federal government to ensure that existing incentive programs encourage the adoption and enforcement of heightened building codes. Current efforts to identify hazardous regions and promote resilience are insufficient, and recent terminations to BRIC and programs like it further heighten risks faced by vulnerable communities who rely on such funding to take proactive, risk-reduction measures.²⁶⁵ Although funding is required to implement changes

260. QUARLES & POHL, *supra* note 28, at 2.

261. *Id.* at 6.

262. FEMA, USDA FOREST SERVICE FISCAL YEAR 2022, *supra* note 257.

263. *Suppression*, U.S. DEP’T OF THE INTERIOR, <https://www.doi.gov/wildlandfire/suppression> [<https://perma.cc/EWY4-BPFU>].

264. *See Reduce Wildfire Risks or Pay More for Fire Disasters*, INT’L ASS’N OF WILDLAND FIRE (Fall 2015), <https://www.iawfonline.org/article/reduce-wildfire-risks-or-pay-more-for-fire-disasters> [<https://perma.cc/7QDR-928Z>] (sharing the position statement from the Large Wildland Fires Conference).

265. *See FEMA Launches Building Resilient Infrastructure and Communities*, FEMA (Mar. 17, 2021), <https://www.fema.gov/fact-sheet/fema-launches-building-resilient-infrastructure-and-communities> [<https://perma.cc/FSJ3-XA7A>] (“FEMA is excited about BRIC’s potential to help communities proactively reduce their vulnerability to natural hazard events, and in turn, make the nation more resilient.”).

in both mapping and mitigation aid programs, investment today can make a much greater difference than it can after the next disaster strikes.