

# The Wildland-Urban Interface: The Problem, Trends, & Solutions

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A photograph of a forest fire. The scene is filled with tall, thin trees, some of which are engulfed in bright orange and yellow flames. Thick white smoke rises from the fire, partially obscuring the background. In the foreground, there are large, moss-covered rocks and green vegetation. The overall atmosphere is one of destruction and environmental impact.

# The Problem

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**Wildfires are bigger, burn longer, cause more damage, and kill more people than before.**

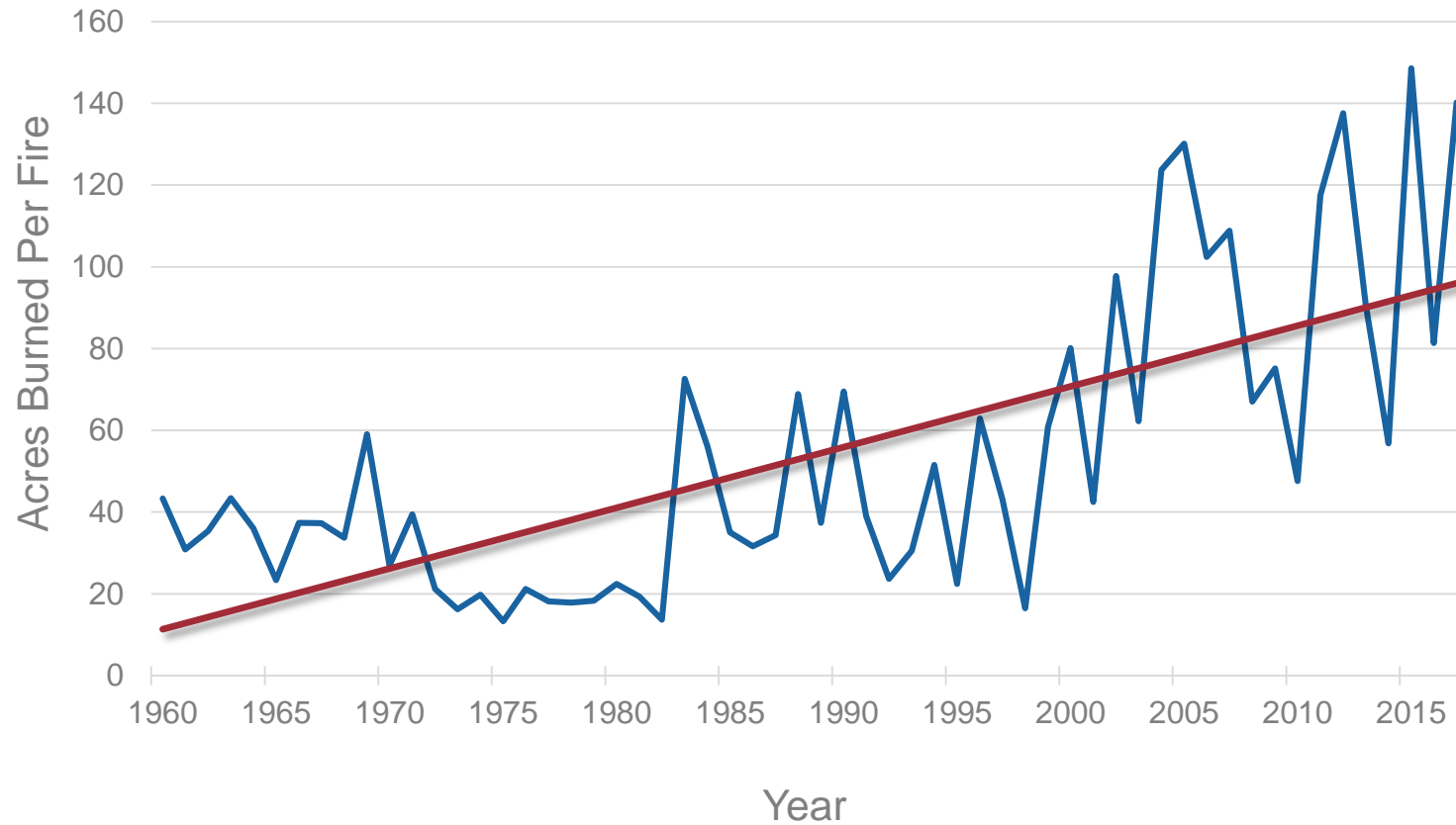


An aerial photograph showing a residential development with numerous houses and winding roads in the foreground. The houses have various roof colors, including blue, brown, and grey. The development is bordered by a large, dense forest of tall, thin trees, likely pines, which appears to be a fire-prone area. The text "Homes built on fire-prone lands increase risk and cost." is overlaid in white on the forested area.

**Homes built on fire-prone lands increase risk and cost.**

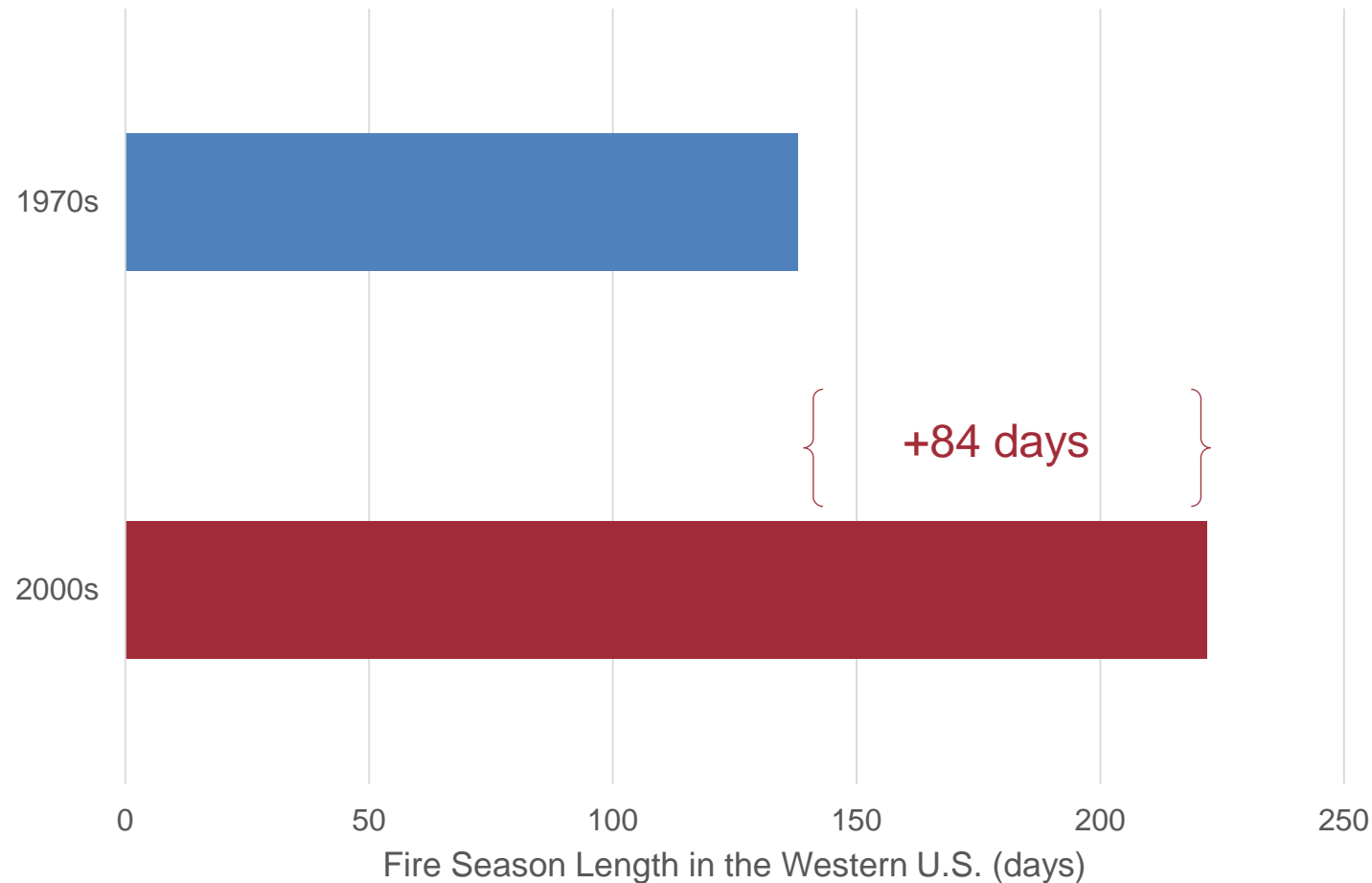


# Wildfires Are Bigger



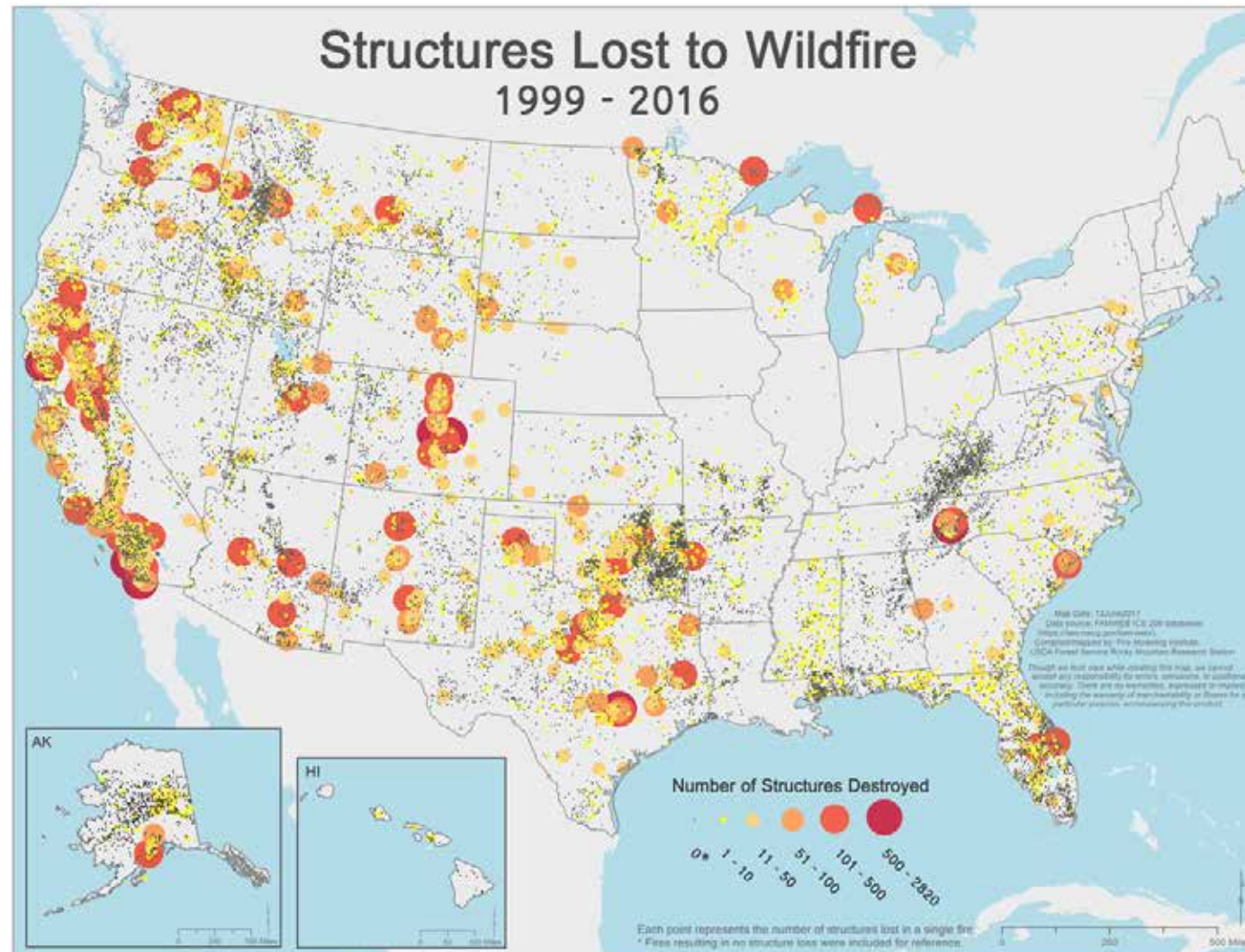
- Acres burned per fire has doubled since the 1990s.
- Fires also burn twice as long.

# Wildfire Season is Longer



- In the western U.S., the average fire season is 84 days longer than in the 1970s.
- Globally, the length of the fire season increased 19% between 1979-2013, or by about one month.

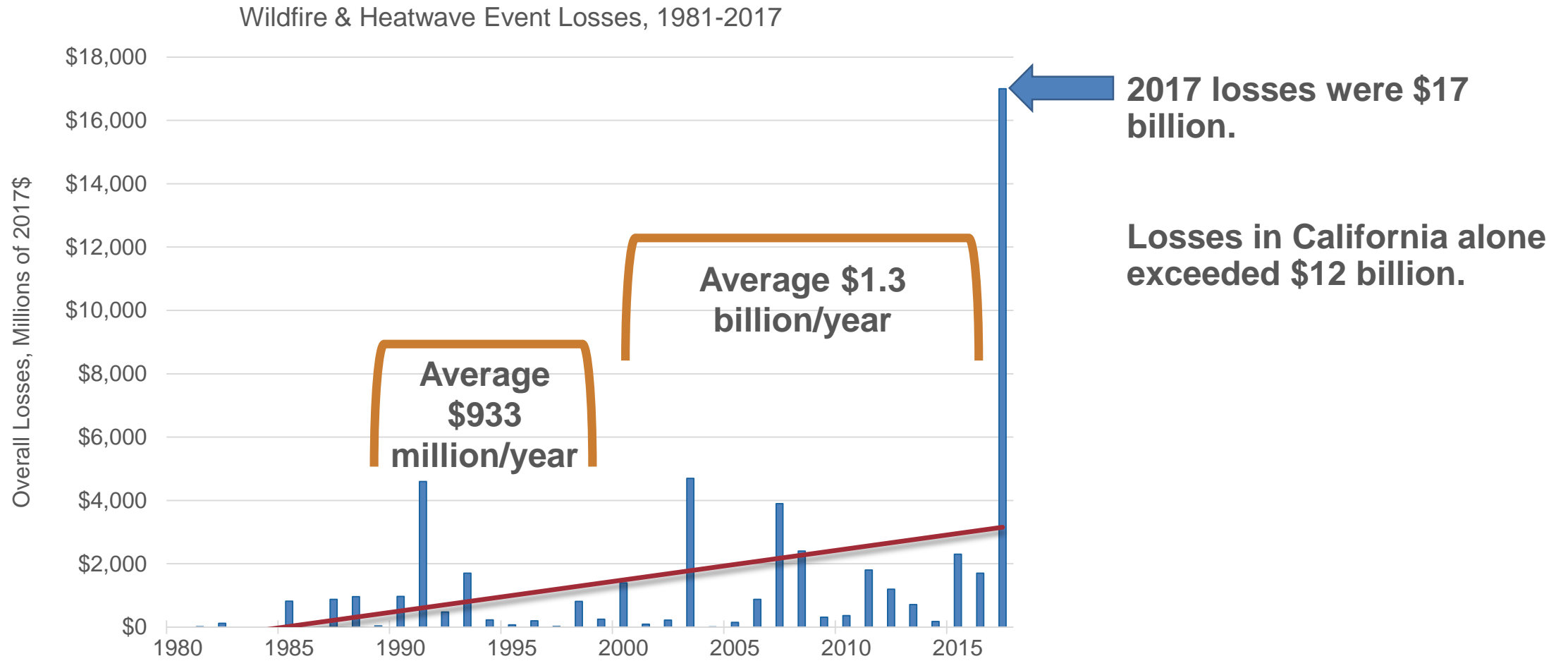
# More Communities Are Impacted by Wildfire



- Since 2010, more than 35,000 structures have been lost to wildfire.
- In the 2000s, the average was 2,300/year.
- From 2010-2017, the average was 4,300/year.
- From 2000-2016, more than 3,000 U.S. communities had a 100+ acre wildfire within 10 miles of town.

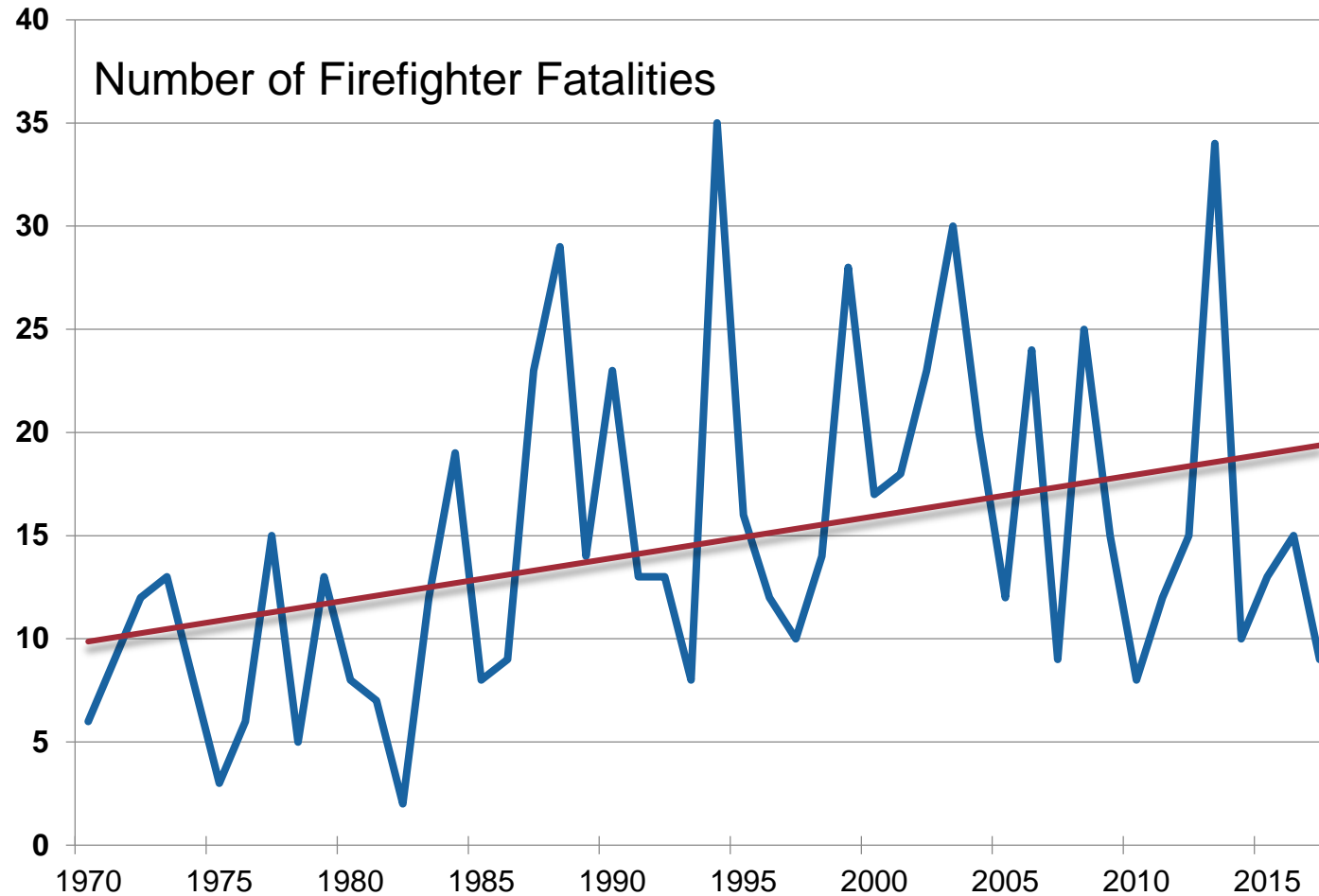


# Insurance Losses Are Rising





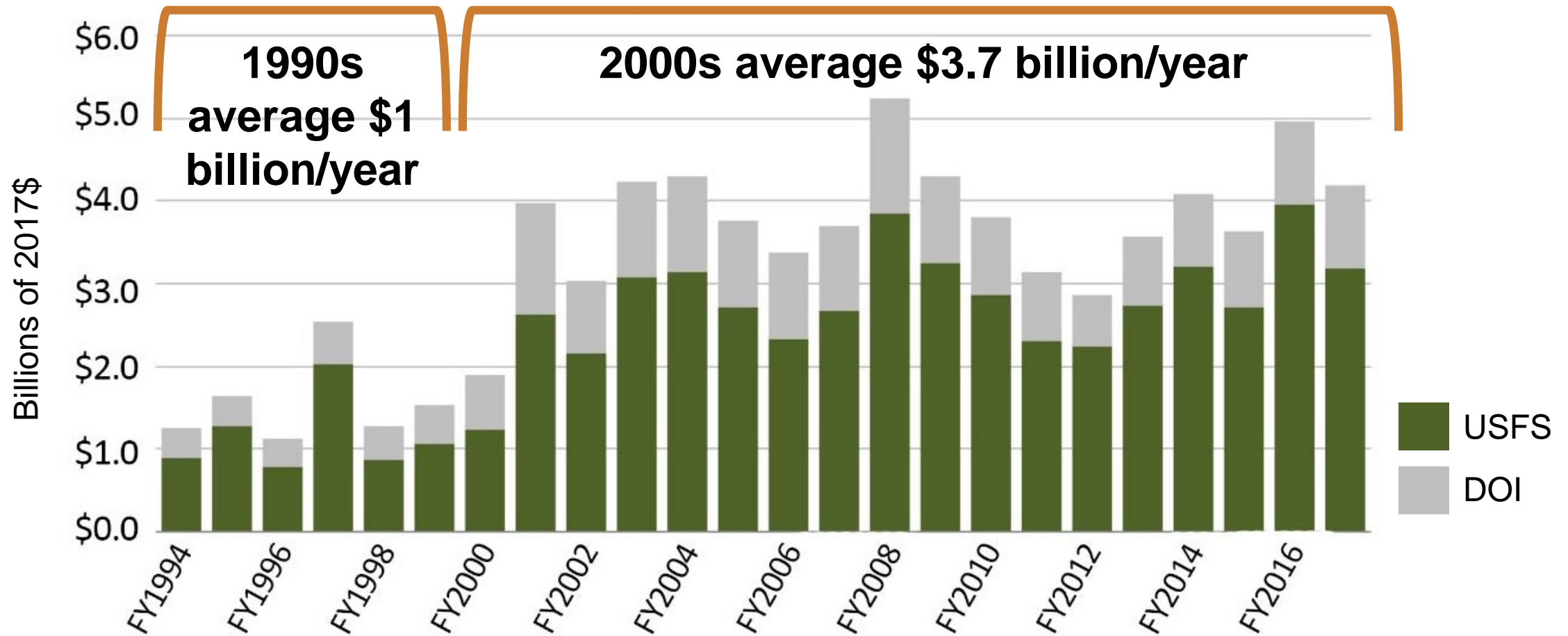
# Danger Is Increasing



- Average firefighter fatalities rose from 9 per year in the 1970s to 19.3 in the 2000s.
- In the 2017 California wildfires, there were 45 civilian fatalities.

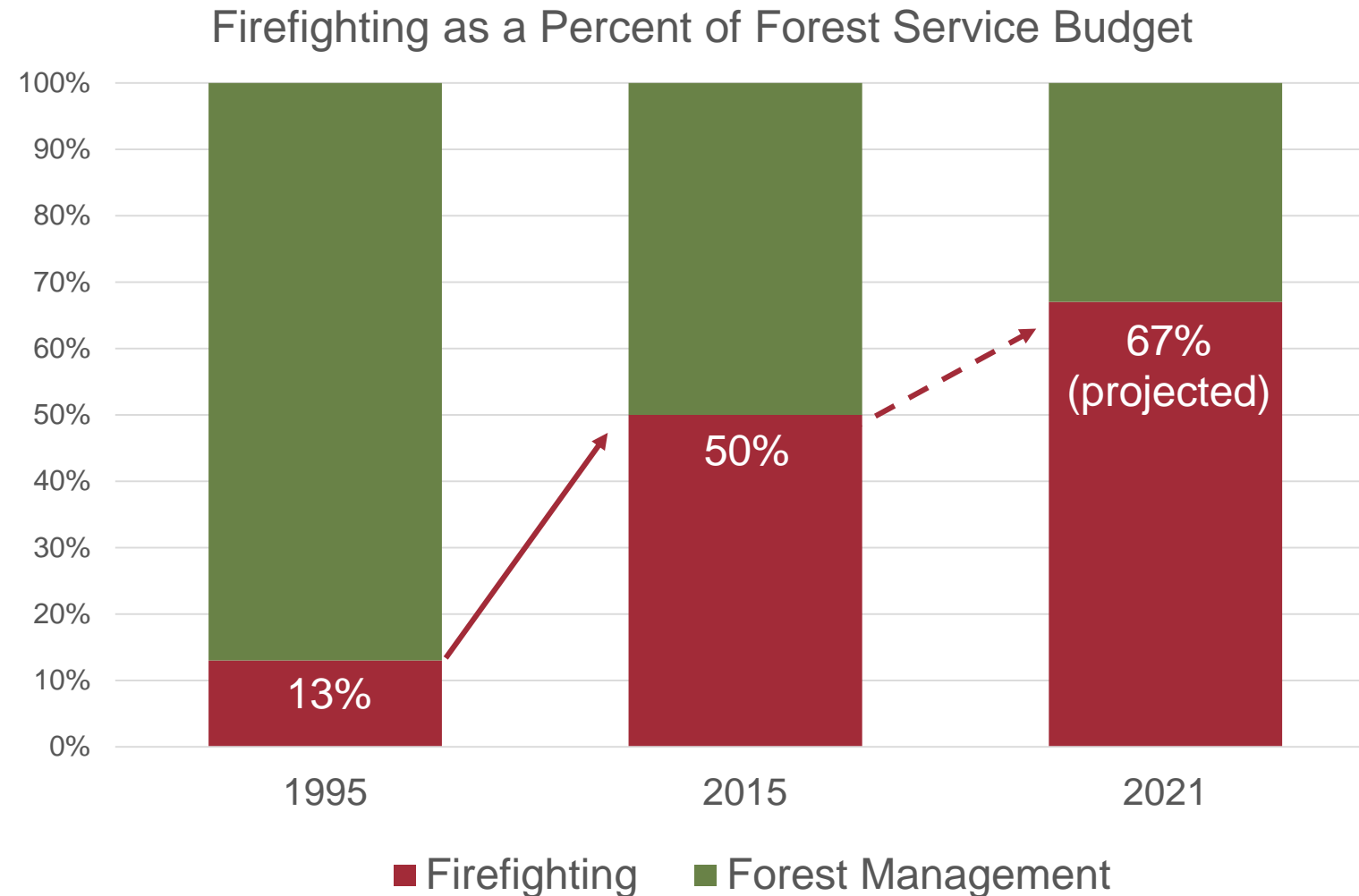


# Federal Suppression Costs Are Soaring





# Most of the Forest Service Budget Goes To Firefighting



# Fire Borrowing Impacts Forest Management

From 2000-2015, the U.S. Forest Service:



## Gained

+114% fire staff

## Lost

- 64% land management planning
- 39% forest management staff
- 28% facilities
- 28% recreation, heritage, wilderness
- 24% vegetation management
- 18% wildlife and fish management





# Federal Agencies Pay Majority of Firefighting Costs

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**FEMA**

**Not Local Governments Making Land Use Decisions**

A helicopter is seen in flight against a backdrop of a large wildfire. The fire is intense, with bright orange and yellow flames rising from a dense layer of thick, grey smoke. The background shows a hazy, mountainous landscape under a bright, overcast sky. The overall scene is one of a major fire incident in progress.

“

If state and local agencies became more financially responsible for WUI protection, it would likely encourage these agencies to more actively implement land use regulations that minimize risk to people and structures from wildfire.”

**U.S. Department of Agriculture  
Office of Inspector General, 2006**



A photograph of a forest fire. In the foreground, there are mossy rocks and green vegetation. In the background, tall trees are visible, with thick white smoke rising from the ground and flames consuming some of the trees. The word "Trends" is overlaid in white text on the left side of the image.

# Trends

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**The problem is likely to get worse in the future.**

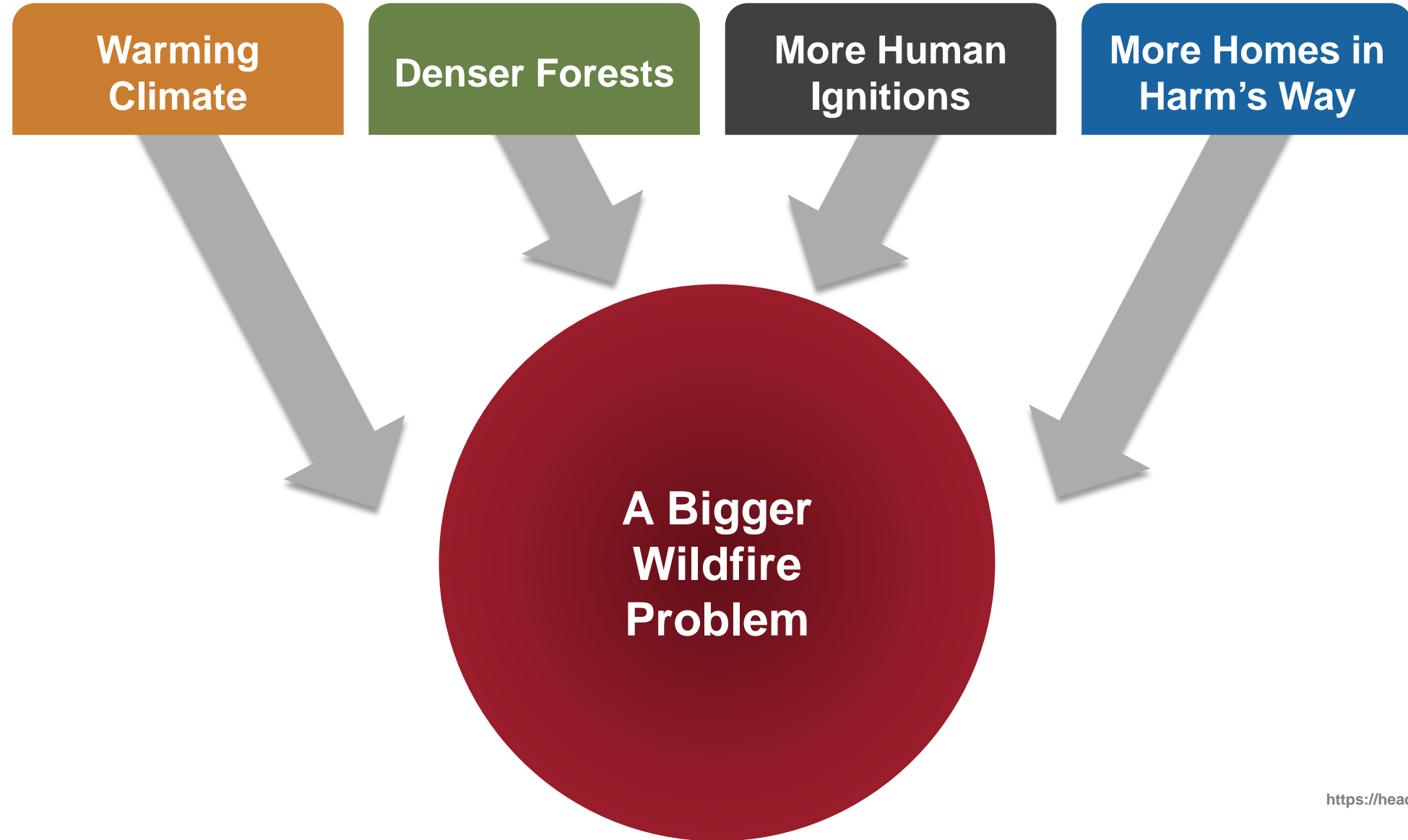
Photo: FEMA- Andrea Booher

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# Current Trends Make The Problem Worse

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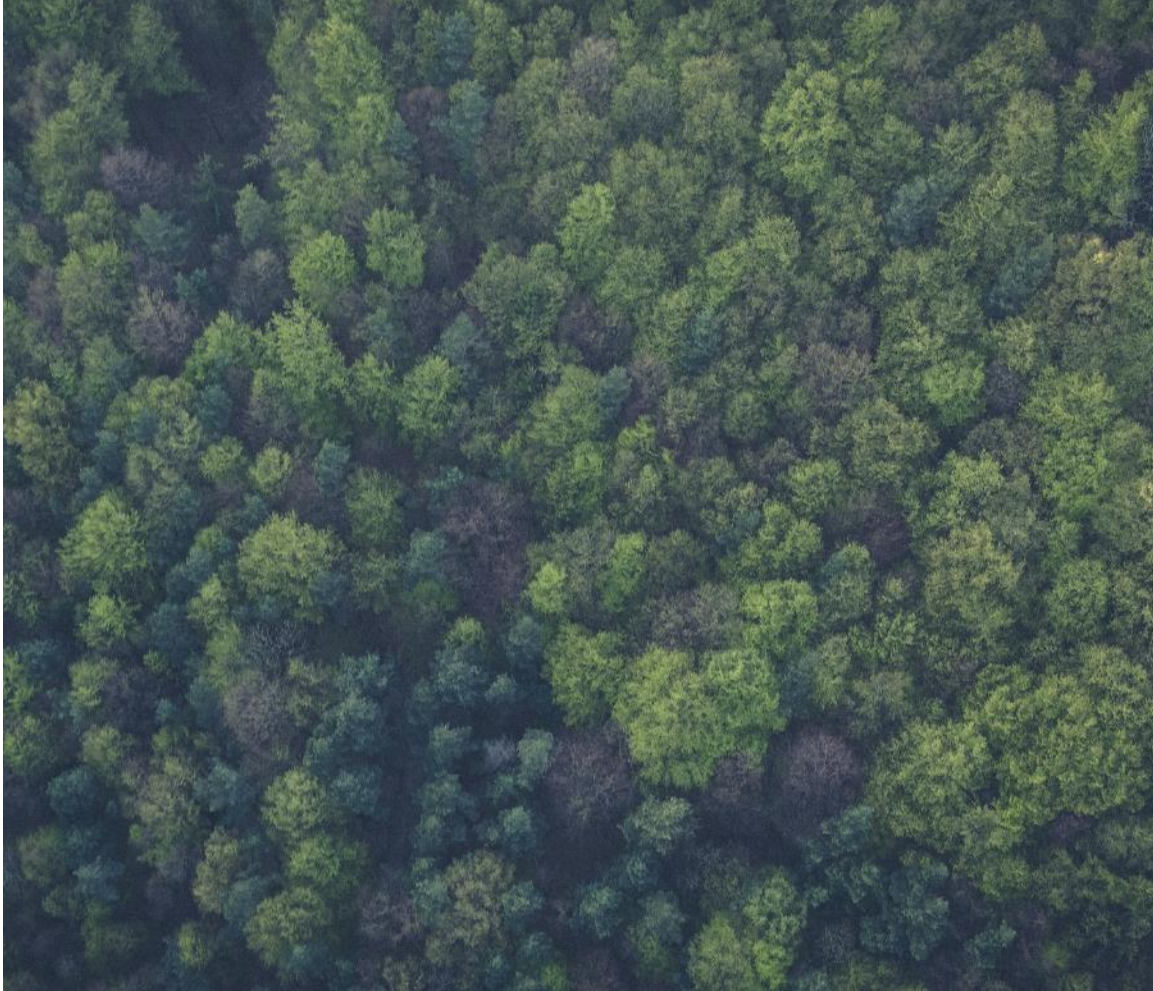
## Warming Climate



- **Since 2000, 75% of forests in the Western U.S. have become significantly drier.**
- **The frequency of large fires is tied to earlier snowmelt and longer fire season.**
- **Climate change accounts for more than half of the increase in area burned since 1985.**
- **Fire suppression cost increases from climate change are estimated to be \$800 million to \$2 billion per year by mid-century**



## Denser Forests



- A century of fire suppression has led to an accumulation of fuels in many ecosystems.
- In many places, the infill of younger trees and accumulation of dead trees facilitates extreme fire behavior.
- This pattern makes fire response more difficult and dangerous.

## More Human Ignitions



- **84% of all wildfires are started by humans.**
- **Human-ignited fires occur more frequently throughout the year, tripling the length of the fire season.**
- **Human-ignited fires are most common in the wildland-urban interface.**





## Wildland-Urban Interface:

*The area where houses and other human development meet or intermingle with wildland vegetation.*



# The Wildland-Urban Interface Is Growing



Photo: FEMA- Andrea Booher

- As of 2010, 34% of single-family homes in the U.S. are in the WUI.
- The WUI is the fastest growing land use type in the conterminous U.S.
- Since 1990, 60% of new homes in California, Washington, and Oregon have been built in the WUI.
- Nearly half of the West's population lives in the WUI.

Martinuzzi, Sebasti n; Stewart, Susan I.; Helmers, David P.; Mockrin, Miranda H.; Hammer, Roger B.; Radeloff, Volker C. 2015. The 2010 wildland-urban interface of the conterminous United States. Research Map NRS-8. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 124p. <https://www.nrs.fs.fed.us/pubs/48642>.

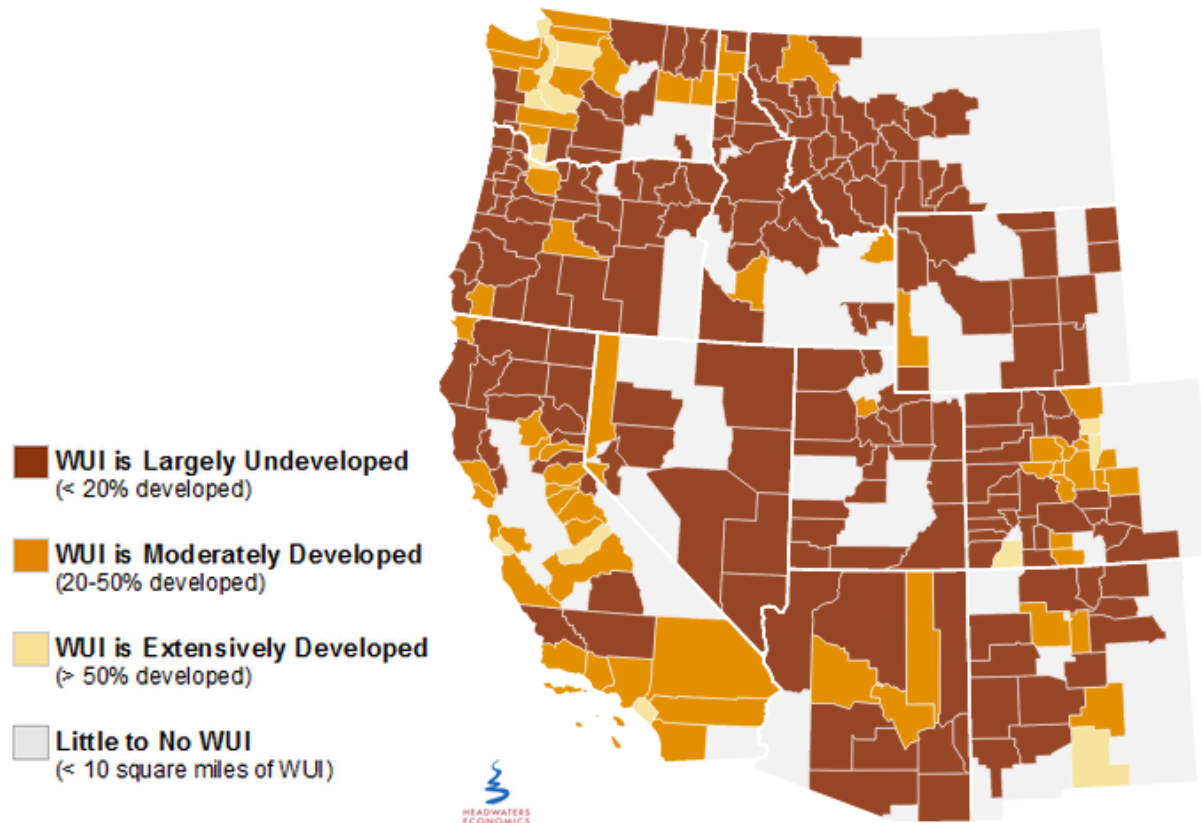
Radeloff, V.C. et al. 2017. Rapid growth of the US wildland-urban interface raises wildfire risk. PNAS 115(13): 3314-3319. [www.pnas.org/cgi/doi/10.1073/pnas.1718850115](http://www.pnas.org/cgi/doi/10.1073/pnas.1718850115).

Hammer, R., Radeloff, V., Fried, J., and Stewart, S. 2007. Wildland-urban interface housing growth during the 1990s in CA, OR, and WA. Int'l Jr. of Wildland Fire. Available online: [https://www.researchgate.net/publication/228671575\\_Wildland-urban\\_interface\\_housing\\_growth\\_during\\_the\\_1990\\_in\\_California\\_Oregon\\_and\\_Washington](https://www.researchgate.net/publication/228671575_Wildland-urban_interface_housing_growth_during_the_1990_in_California_Oregon_and_Washington).

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# The Potential for More Homes in the WUI Is Great



- Only 16% of the WUI in the West is developed
- 84% of the WUI in the West is undeveloped



A photograph of a forest fire. In the foreground, there are mossy rocks and green vegetation. In the background, several trees are engulfed in bright orange and yellow flames, with thick white smoke rising from the fire. The word "Solutions" is written in a large, white, sans-serif font across the middle of the image, underlined.

# Solutions



A photograph showing two men in the foreground, both wearing caps and jackets, looking at a large map they are holding. The man on the left is wearing a tan jacket and a light-colored cap, while the man on the right is wearing a dark jacket with 'THE NORTH FACE' logo and a dark cap. They are standing on a dirt path in a mountainous area with snow-covered peaks and some bare trees. Other people are visible in the background, including a woman in a purple jacket on the left and a man in a green jacket on the right. The scene is brightly lit, suggesting a sunny day.

**There is no single solution, but land use planning is a critical piece of the puzzle.**



# Many Actions Are Needed to Become Fire Adapted

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# Voluntary Landowner Programs Help



Small changes to areas around homes can reduce vulnerability to wildfire.

Programs include:

- Firewise USA
- Ready! Set! Go!
- Fire Adapted Communities Learning Network

Participation is voluntary and requires ongoing maintenance.

# Fuel Treatments Are Most Effective Around Communities

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Image: NFPA- [https://www.youtube.com/watch?time\\_continue=4&v=vL\\_syp1ZScM](https://www.youtube.com/watch?time_continue=4&v=vL_syp1ZScM)

**To protect homes, fuel treatments are most effective when in the immediate vicinity of structures.**



# Fuel Treatments Aren't Enough



**We can't treat all of the acreage.**

- From 2001-2015, almost 17 million acres of federal land received mechanical treatment
- This is less than 4% of all Forest Service and BLM lands.
- During the same time period, over 101 million acres burned

**Forests only account for 40% of acreage burned since 1984.**

- The majority of fires are grassland and shrubland

# Most WUI Disasters Happen Because of Embers

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**Most WUI disasters happen under extreme conditions, when embers are blown miles ahead of fire lines and ignite combustible structures.**

**Fuel breaks are less effective under extreme conditions unless structure ignitability is also mitigated.**

**Homes can be made safer by using ember-resistant materials and techniques.**





**“ Mandatory zoning and building regulations may be needed to compel landowners to take the actions necessary to protect their homes and property from wildfire.”**

**U.S. Department of Agriculture  
Office of Inspector General, 2006**

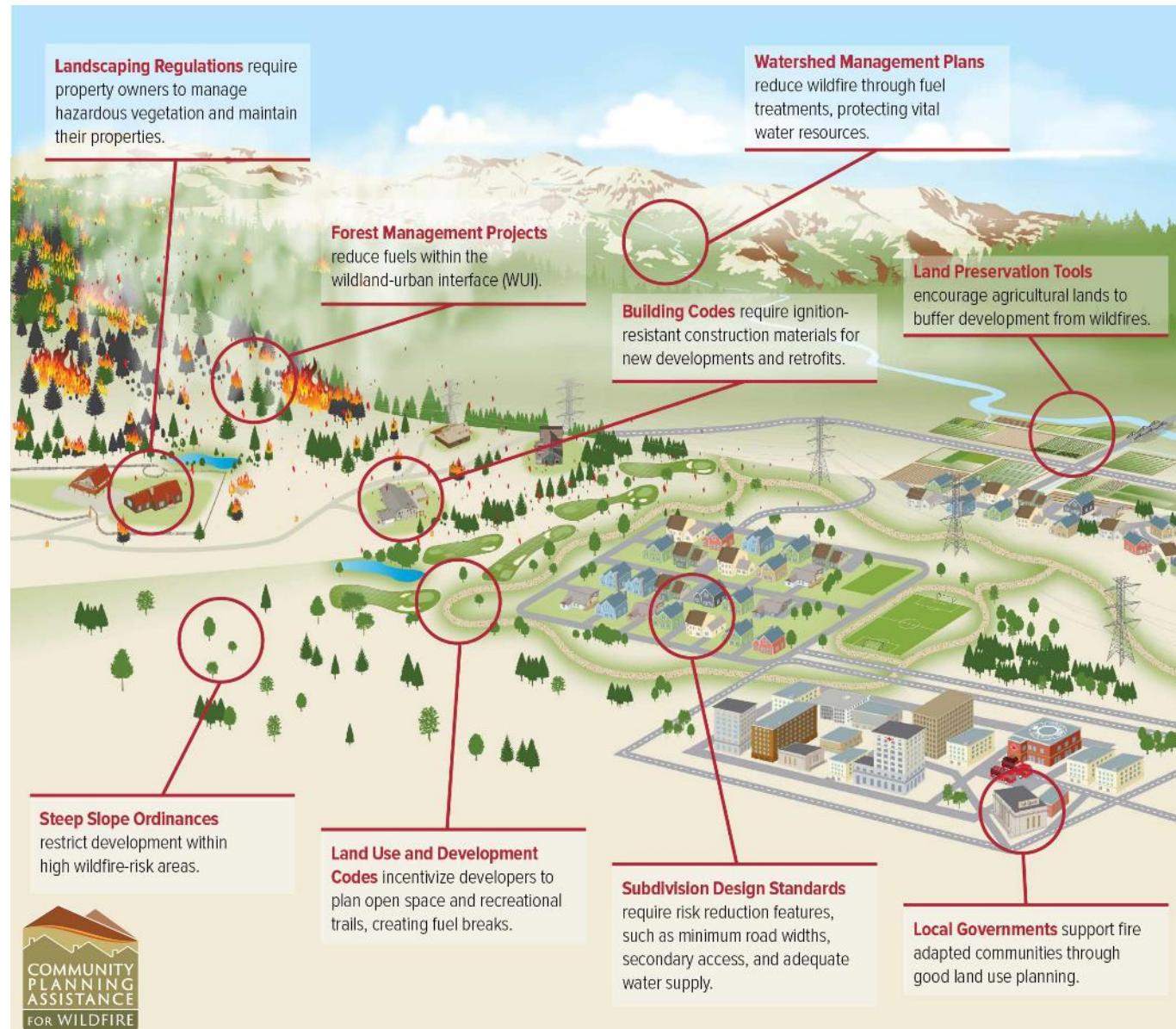


## Community Planning Assistance for Wildfire (CPAW) helps communities better plan the wildland-urban interface.

- Offers free land use planning assistance to communities.
- Communities participate voluntarily and local jurisdictions determine whether to adopt recommendations.
- CPAW is funded by the US Forest Service and private foundations.



# Examples of Land Use Planning Tools to Reduce Risk



# Land Use Planning Strategies Are Diverse

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Typical WUI Development

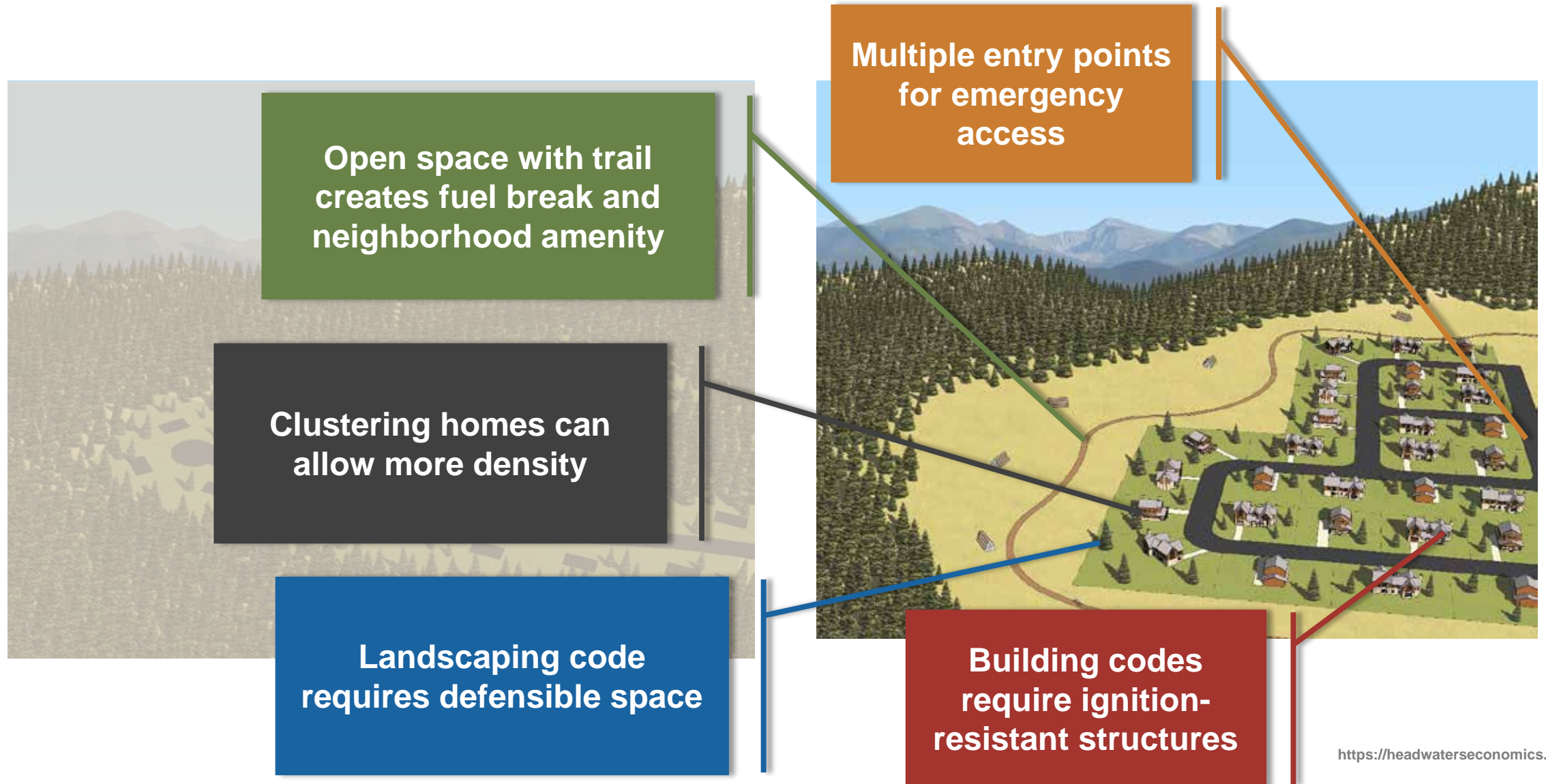


Example Safer WUI Development





# Land Use Planning Strategies Are Diverse



# CPAW Provides Communities With:

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## Land Use Planning

Community-specific land use planning recommendations.

## Risk Assessments

Maps and identifies areas of concern.

## Capacity Building

Workshops, trainings and webinars.

## Research & Science

Data and custom research.





# CPAW Has Worked With 26 Communities



## Arizona

Flagstaff

## California

Mammoth Lakes  
San Diego

## Colorado

Boulder County  
Huerfano County  
San Luis Valley  
Summit County

## Idaho

Boise

## Minnesota

Bemidji

## Montana

Lewis & Clark  
County  
Missoula County  
Park County

## New Jersey

Township of Ocean

## New Mexico

Los Alamos  
Santa Fe  
Taos County

## Oregon

Ashland  
Bend  
Sisters  
Wasco County

## South Dakota

Deadwood

## Tennessee

Pigeon Forge

## Texas

Austin

## Washington

City of Chelan  
Chelan County  
Wenatchee

# CPAW Example: Summit County, Colorado

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## Improvements include:

- Shift from hiding homes in the trees to requiring defensible space
- Planning documents now incorporate wildfire as a risk
- Subdivisions not approved without defensible space



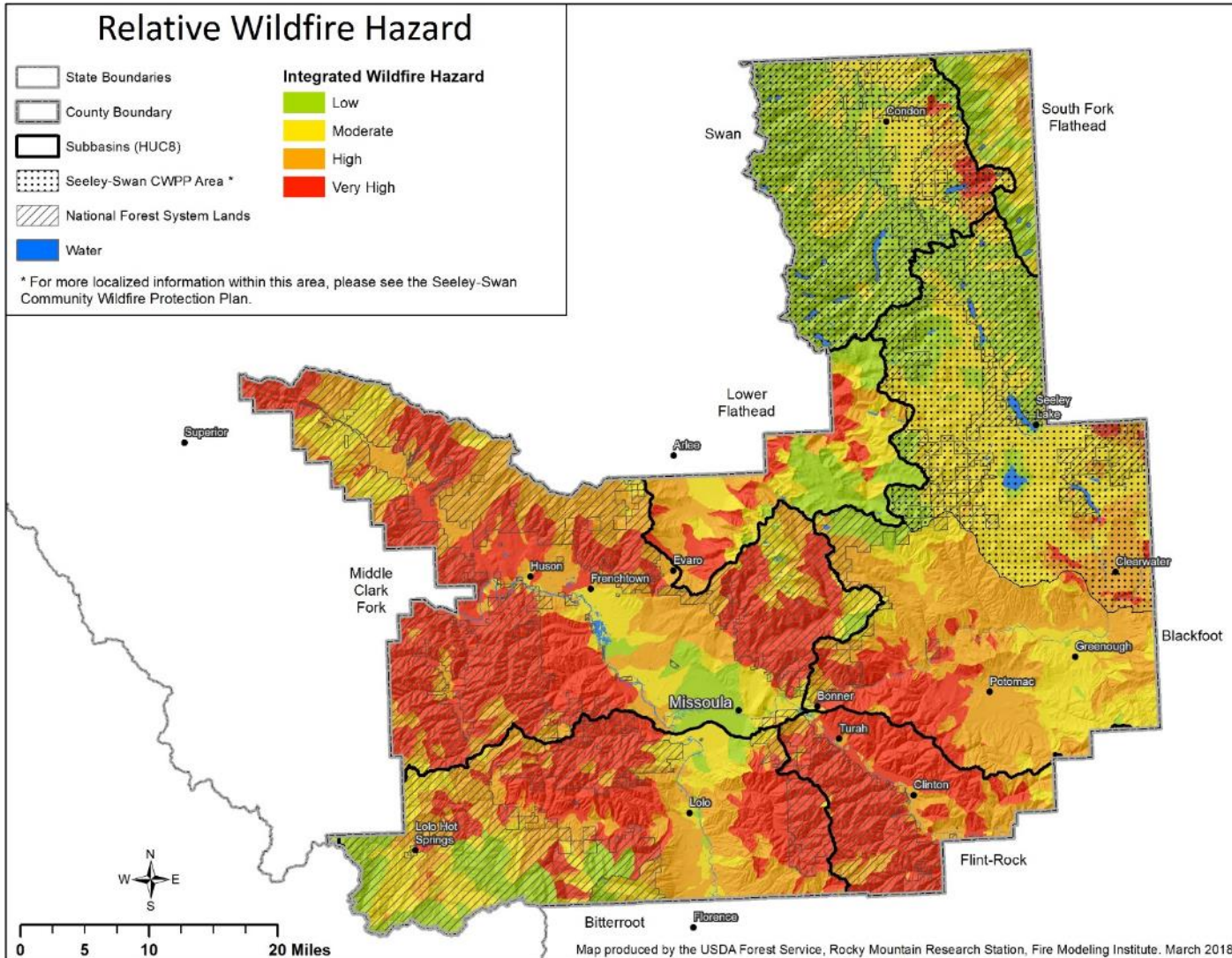
# CPAW Example: Chelan, Washington



Improvements include:

- **City and county adopting WUI Code that requires:**
  - **wildfire-resistant building materials and practices**
  - **access requirements**
  - **appropriate landscaping**
- **Outreach and feedback with building industry**

# CPAW Example: Missoula, Montana



Improvements include:

- First time county has consistent definition and maps of WUI across all lands
- New risk assessment developed through partnership with USFS Rocky Mountain Research Station
- Maps help land use planners determine if more information is needed for development applications





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Missoula County is moving forward in a very positive direction relative to dealing with fire, both wild and introduced, on the landscape. Our efforts would not be possible, or be as effective, without CPAW.”

**Pat O’Herren,  
Chief Planning Officer, Missoula County, MT**

# Other Ideas

- Shift more of the fire suppression costs to the local level
- Require disclosure of fire risk to potential home buyers
- Purchase land and development rights to steer growth away from fire-prone areas
- Refuse to risk firefighter safety

Feature

## Resolving the Increasing Risk from Wildfires in the American West

by Ray Rasker



A wildfire threatens a home near Possum Kingdom, Texas.

**In Brief**

Wildfires have always been part of living in the American West, but today they are bigger, burn longer, cause more damage, and kill more people than ever before. This situation is getting significantly worse in large part because more and more people are choosing to live in forested landscapes, further risking lives and property and putting a significant strain on agency budgets. Add to this scenario the lingering effects of past management practices that have exacerbated fire danger and the expectation of continued changes to the Earth's climate, and we have a management situation where the solutions don't match the severity of the problem. This article describes the trends in wildfires, the challenge of defending private property, the solutions tried so far, and outlines new ideas that could significantly reduce costs and risks by altering the pattern of future home building on fire-prone lands.

[www.the-solutions-journal.org](http://www.the-solutions-journal.org) | March-April 2015 | Solutions | 55



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