



Association of Bay Area Governments



Technical Assistance
for Local Planning

HOUSING

WILDFIRES - PRESERVATION & PROTECTION OF HOMES

SESSION 1

WILDFIRES & HOUSING 101

Overview of fire evolution, fire science, intro to home hardening & defensible space, plus introduction of Marin Wildfire Prevention Authority.

Association of Bay Area Governments | September 30, 2021

Purpose

Join city/county planners with wildfire professionals and experts to proactively protect and preserve housing from wildfires.

Learn from state and national experts that outline current science, technology, programs and best practices.



• Expectations Overall

- The Bay Area has overlapping crises. We need to solve for multiple complicated and connected crises.
 - Housing affordability, climate change, and inequity are all pressing challenges. We can't solve just one crisis.
- Get grounded with current experts to frame issues and ideas more comprehensively with staff.
- Need holistic and integrated policies and programs. Solutions exist - focus on what local government can do to have an impact.

• Expectations of the Session

- Seeking active conversations and the wisdom in the room.
- Turn on camera and participate during discussion portion.

WORK GROUP MEETINGS

WILDFIRES - PRESERVATION & PROTECTION OF HOMES

9/30

Wildfires & Housing 101

Overview of fire evolution, fire science, intro to home hardening & defensible space, plus introduction of Marin Wildfire Prevention Authority.

10/14

Defensible Space & Home Hardening + CAL FIRE Update

Deep dive into defensible space & home hardening with updates from CAL FIRE plus practical resident guidance.

11/4

Evacuations: Laws, Practices & Technology

Exploration of new evacuation laws, OPR updates, and tips on practical implementation of new technology.

12/2

Land Use Planning in the WUI + ADUS

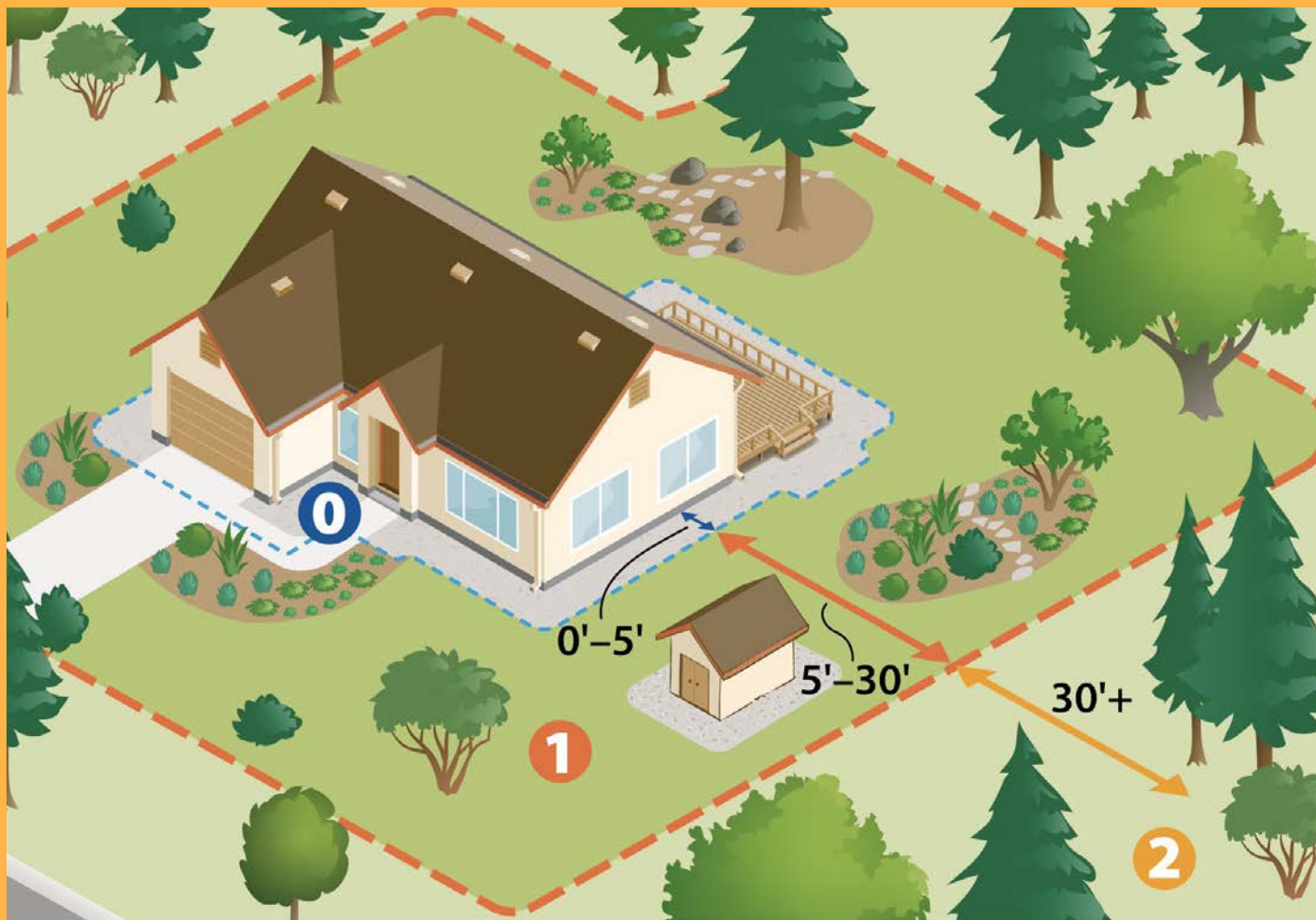
Outline planning & risk mitigation initiatives for wildfires. Explore how to add ADUs and housing in the WUI.



SESSION 1

WILDFIRES & HOUSING 101

How do we learn to live with fires?



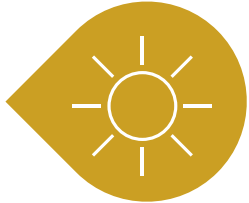
"ACUTE FIRE CRISIS"

CAL FIRE Director Thom Porter, SF Chronicle 8/30/21



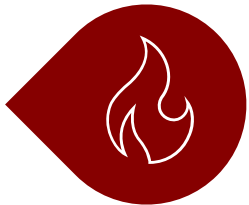
HOUSING & THE WUI

California has the most people living in the WUI – 11 million
More than 1/3 of new homes built between 1990 and 2010 were in the WUI
12% of CA household live in areas that had wildfires since 2010



ENVIRONMENTAL RECALIBRATION

Ever-warming temperatures and climate change
Loss of moisture at highest elevations
Supercharged fire behavior
Weeks of hazardous air quality



WILDFIRE STATS

California has seen 8 of the 10 largest fires in its history in last 4 years
2020

3.7 million acres burned in CA - most ever
\$1.3B estimated emergency fire suppression by CAL FIRE

2021

2.4 million acres burned so far
Dixie Fire – single largest fire in CA history (963,000 acres)
Fires crossing elevation ridge historical limits (Dixie & Caldor)



2017 Tubbs Fire, Coffey Park, Santa Rosa, CA
Photo: CC-BY The National Guard

Agenda

01

OVERVIEW

Welcome, introductions, and overview of Session 1 “Wildfires & Housing 101”.

02

SPEAKERS

4 speakers will ground us in fire trends, fire science, basics of defensible space and home hardening, plus a new JPA model for collaborative wildfire planning & preparation.

03

Q&A / DISCUSSION

Time for questions and discussion with the speakers and among staff.

04

CONCLUSION

Review upcoming sessions and review Resource Guides.

Today's Speakers

KIMIKO BARRETT

Headwaters Economics
Lead Wildfire Research and
Policy Analyst



Why we have to think differently about fires, housing and communities and the role of local agencies and planners

DANIEL GORHAM

Insurance Institute for Business
& Home Safety (IBHS)
Research Engineer



How fires work, how homes ignite, and the impacts on housing

TODD LANDO

Central Marin Fire Dept.
*Wildfire and Hazard Mitigation
Specialist & NFPA Certified
Wildfire Mitigation Specialist*



Myths and facts on defensible space

MARK BROWN

Marin Wildfire Prevention
Authority
Executive Officer



How the MWPA was created, and its structure, funding, & program initiatives

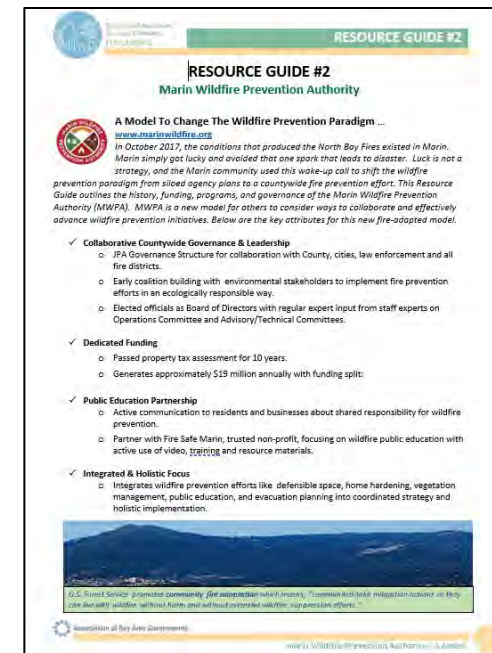
SESSION 1 - Resource Guides

✓ Guide #1 -Wildfires - Research, Science & Key Organizations

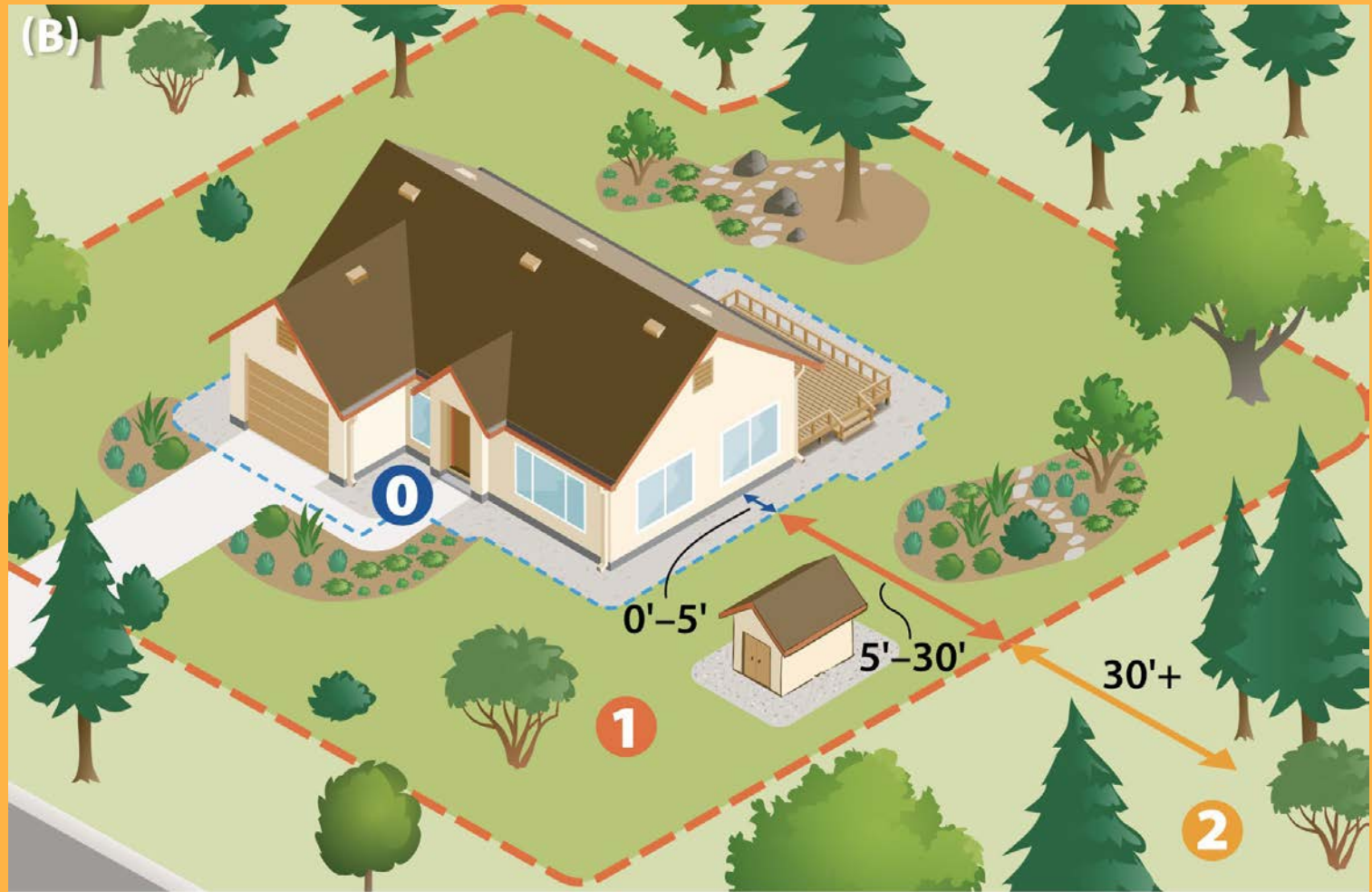
Resource list to key research and organizations regarding wildfires and housing.

✓ Guide #2 - Marin Wildfire Prevention Authority (MWPA)

Overview of MWPA including history, structure, governance, funding and programs.



Speaker Presentations





Why we have to think differently about fires, housing and communities and the role of local agencies and planners

KIMIKO BARRETT

Headwaters Economics

- Lead wildfire research and policy analyst at [Headwaters Economics](#), a non-partisan independent research organization based in Bozeman, Montana.
- Program Director for [Community Planning Assistance for Wildfire \(CPAW\)](#), working with communities across the country to better plan, mitigate, and adapt to wildfires.
- As a researcher, she enjoys engaging with people on complex issues such as community resilience, adaptation, and vulnerability.
- Undergraduate degrees in Political Science and Japanese, Master's in Geography from Montana State University and a Ph.D. in Forestry from University of Montana.

Adapting to Wildfires: Planning for Inevitable Risks



Kimiko Barrett, Ph.D.

Wildfire Research & Policy Lead

September 30, 2021

The Problem



The Problem



**Wildfires are
getting
worse**



100,000+ structures
destroyed in the
U.S. since 2005



2 of every 3 have
been in California

The Problem



**Wildfires are
getting
worse**



**More homes
built in
harm's way**

34% of all homes
located in high-
risk areas



The Problem



**Wildfires are
getting
worse**



**More homes
built in
harm's way**

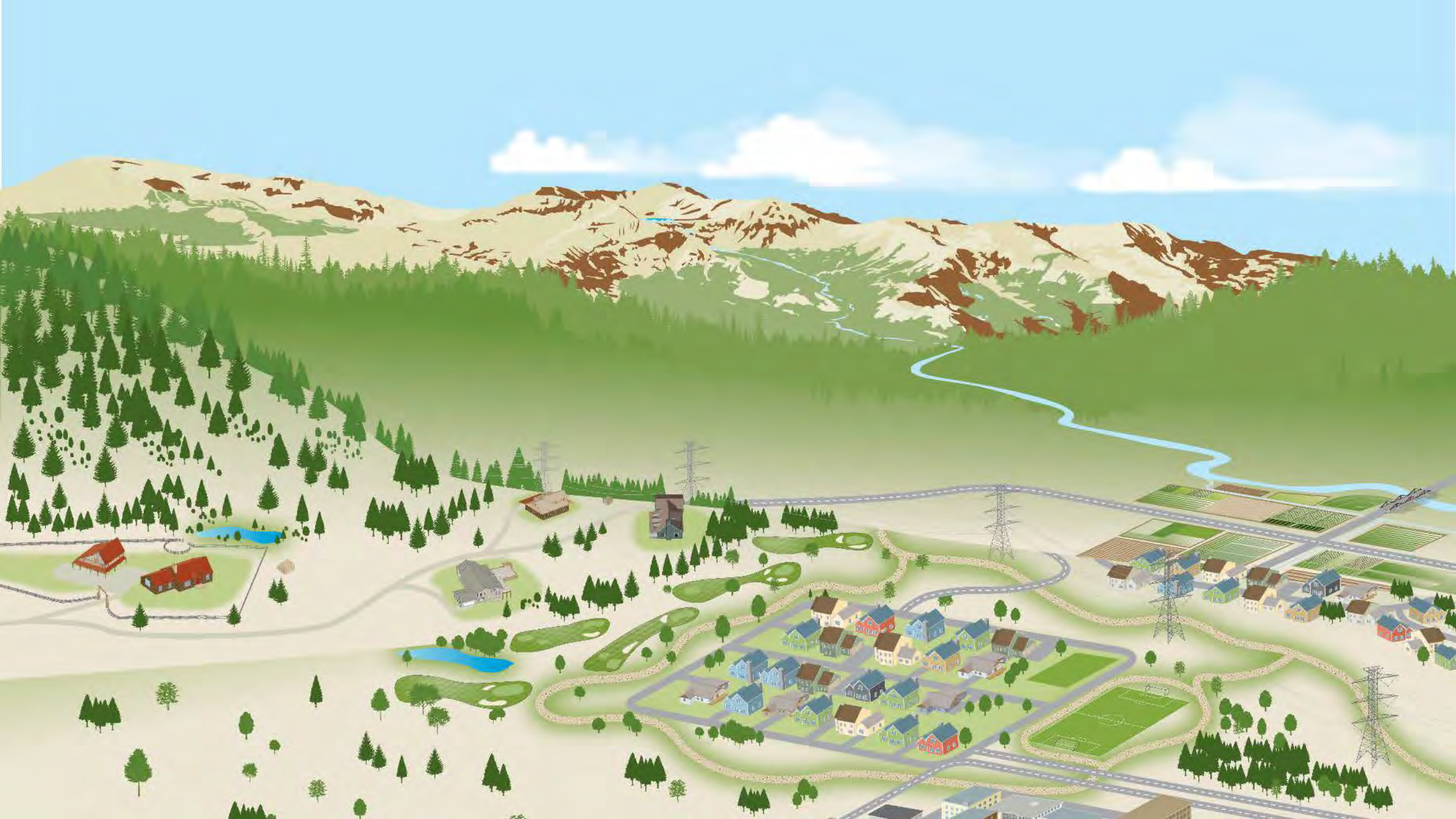


**Impacts are
unequal**

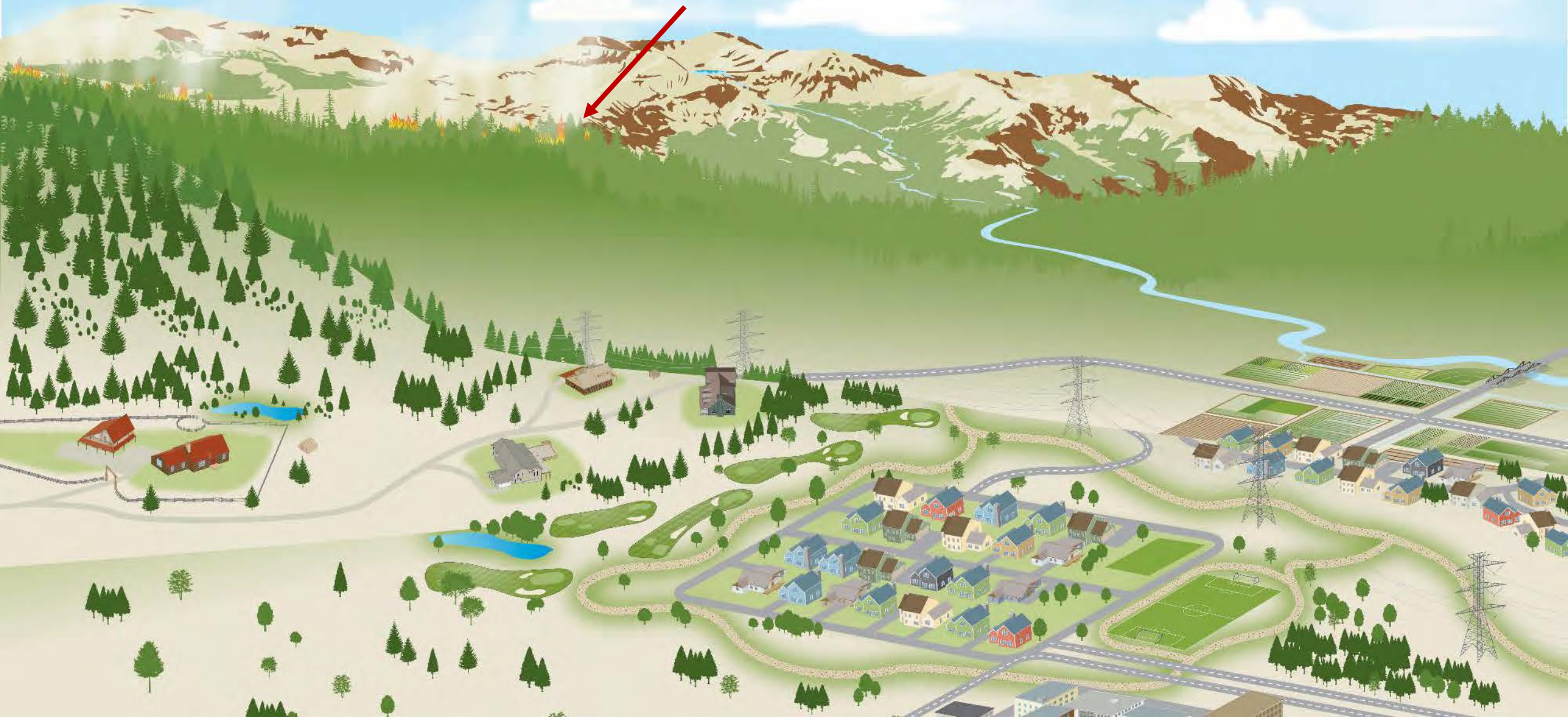
...but we also know how to do things better.



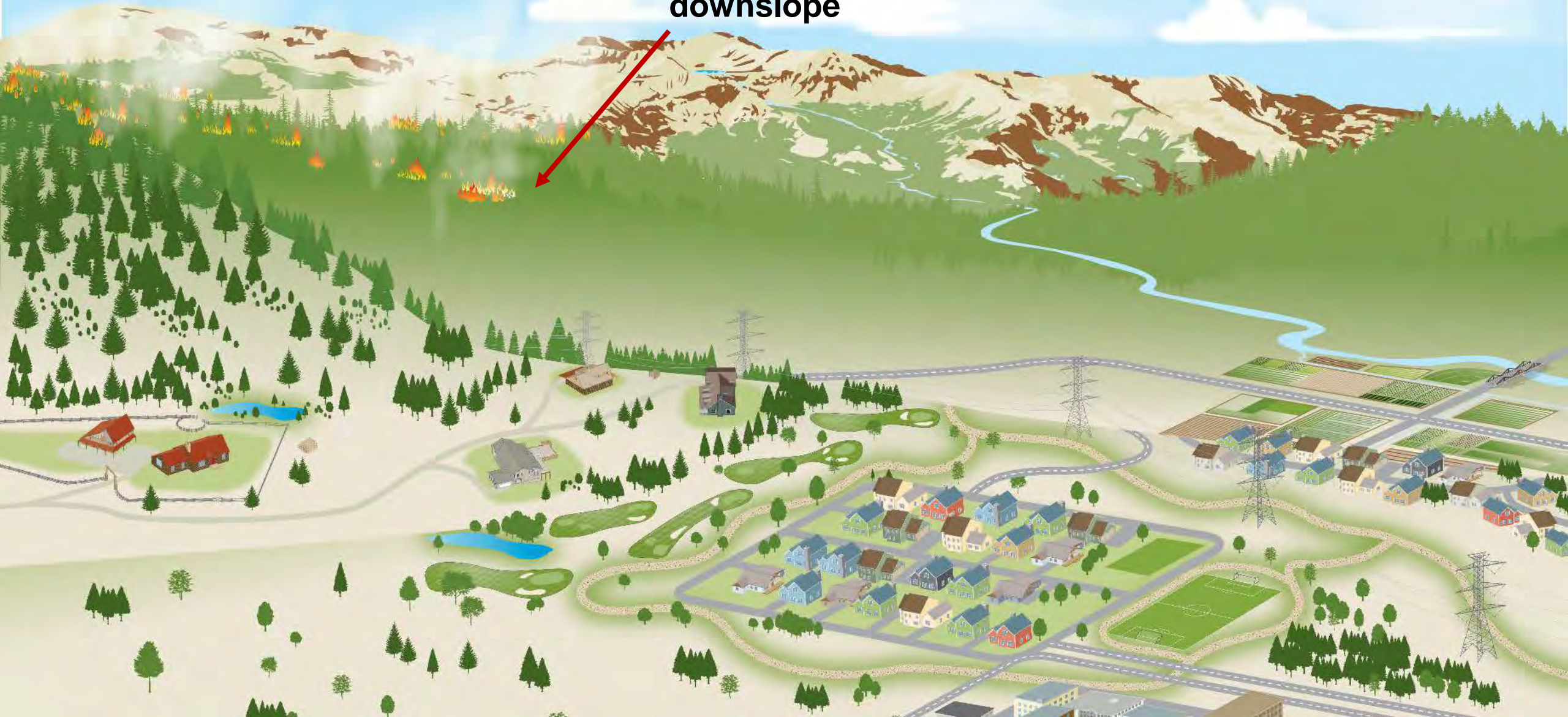




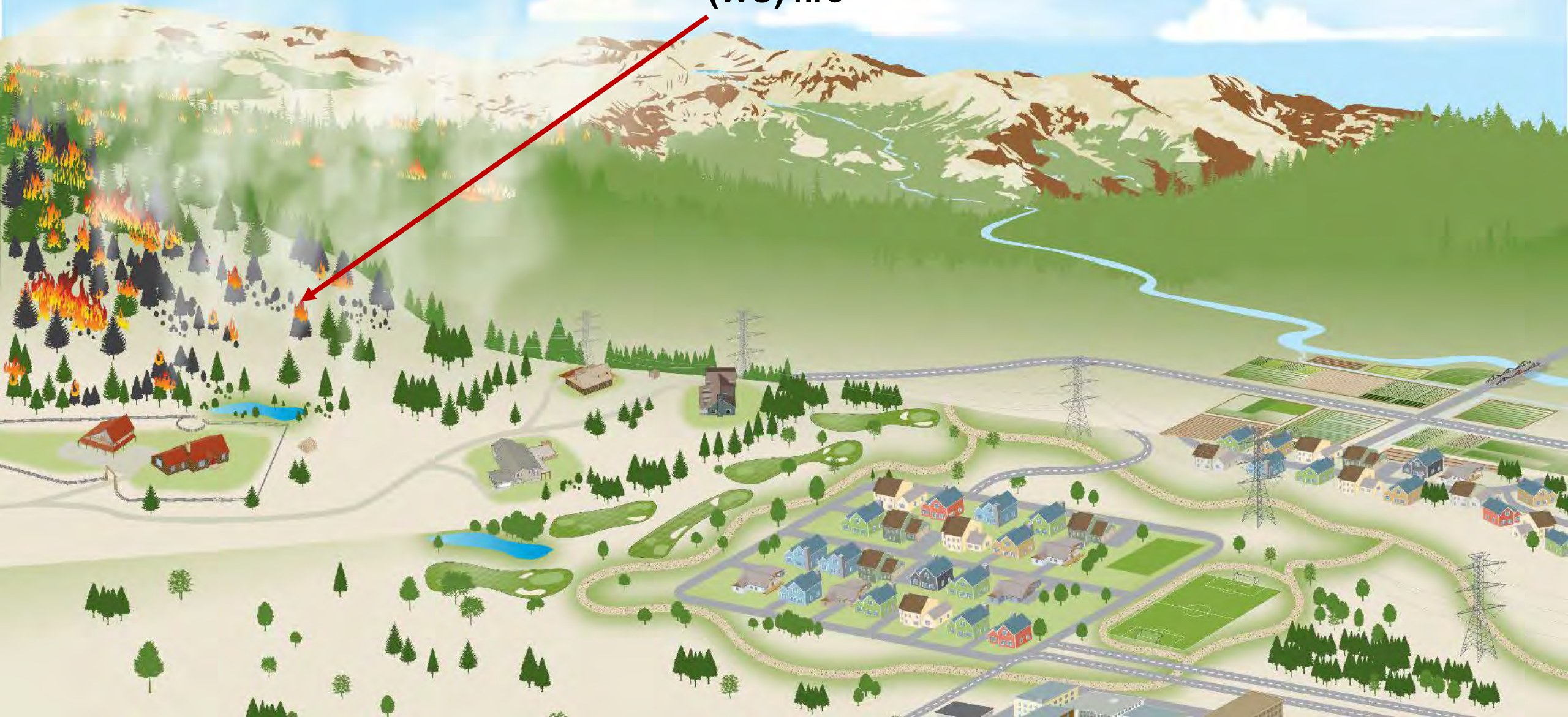
**Fire breaks out in
the backcountry**



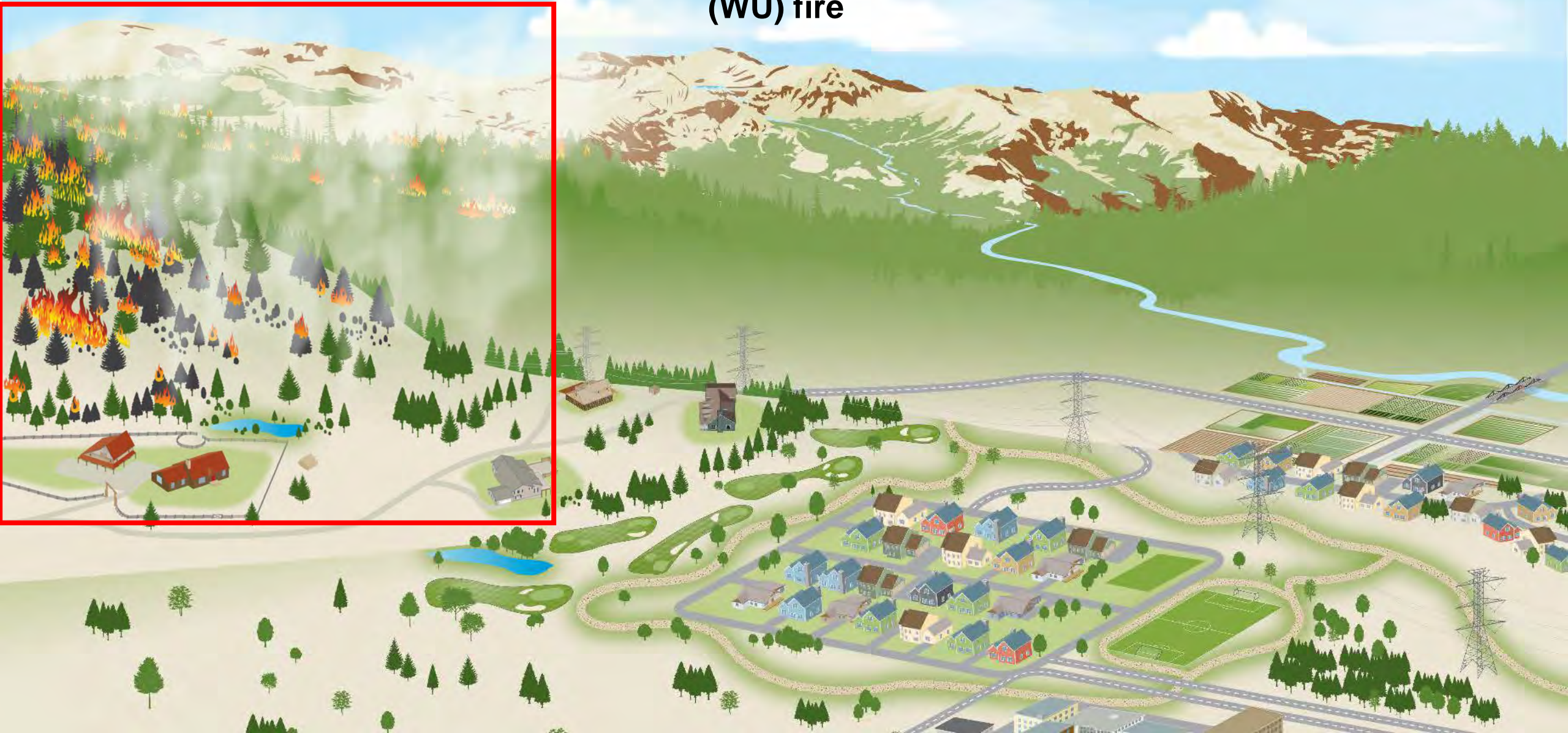
**Fire moves
downslope**

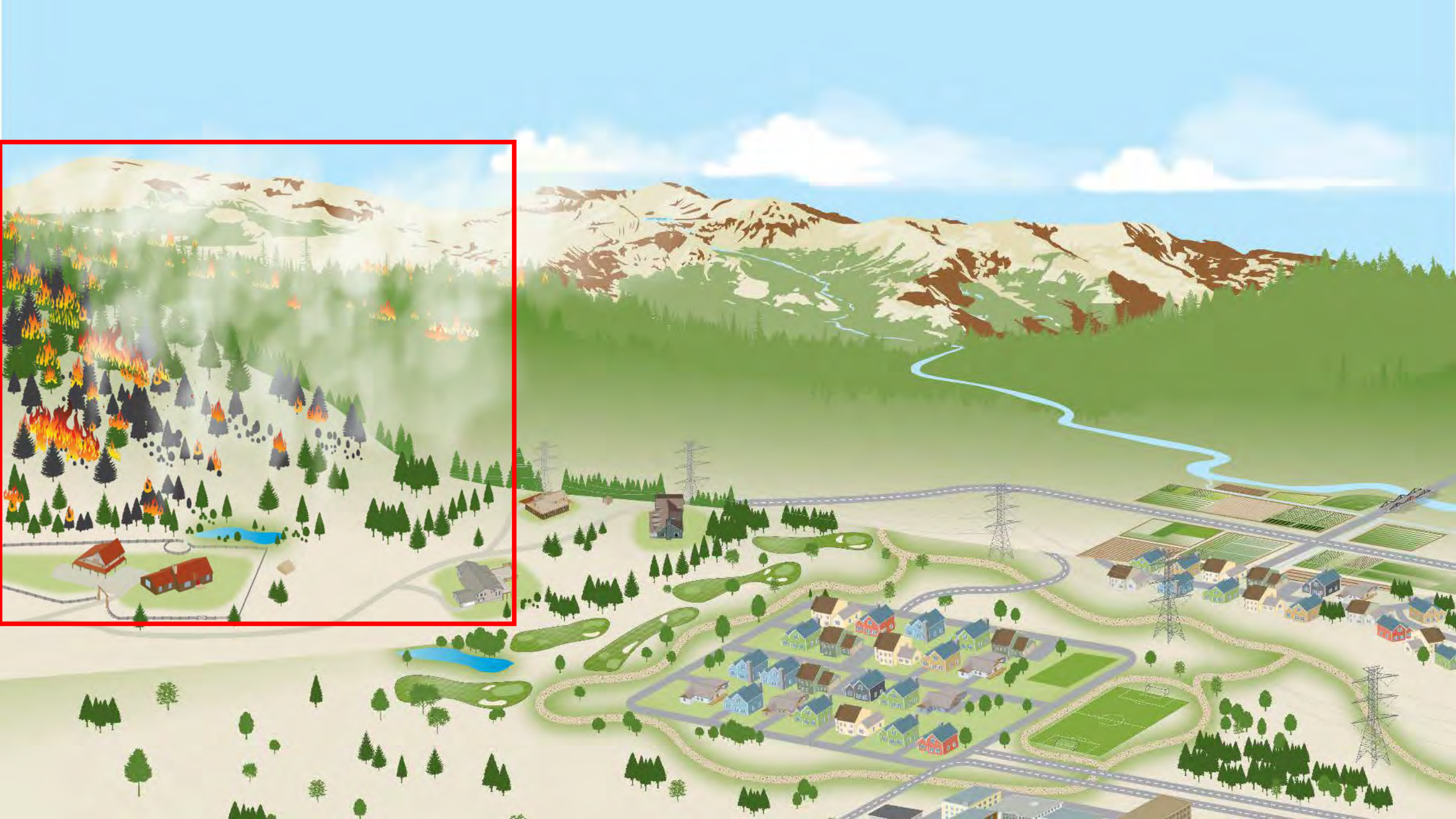


Wildland-Urban (WU) fire



Wildland-Urban (WU) fire



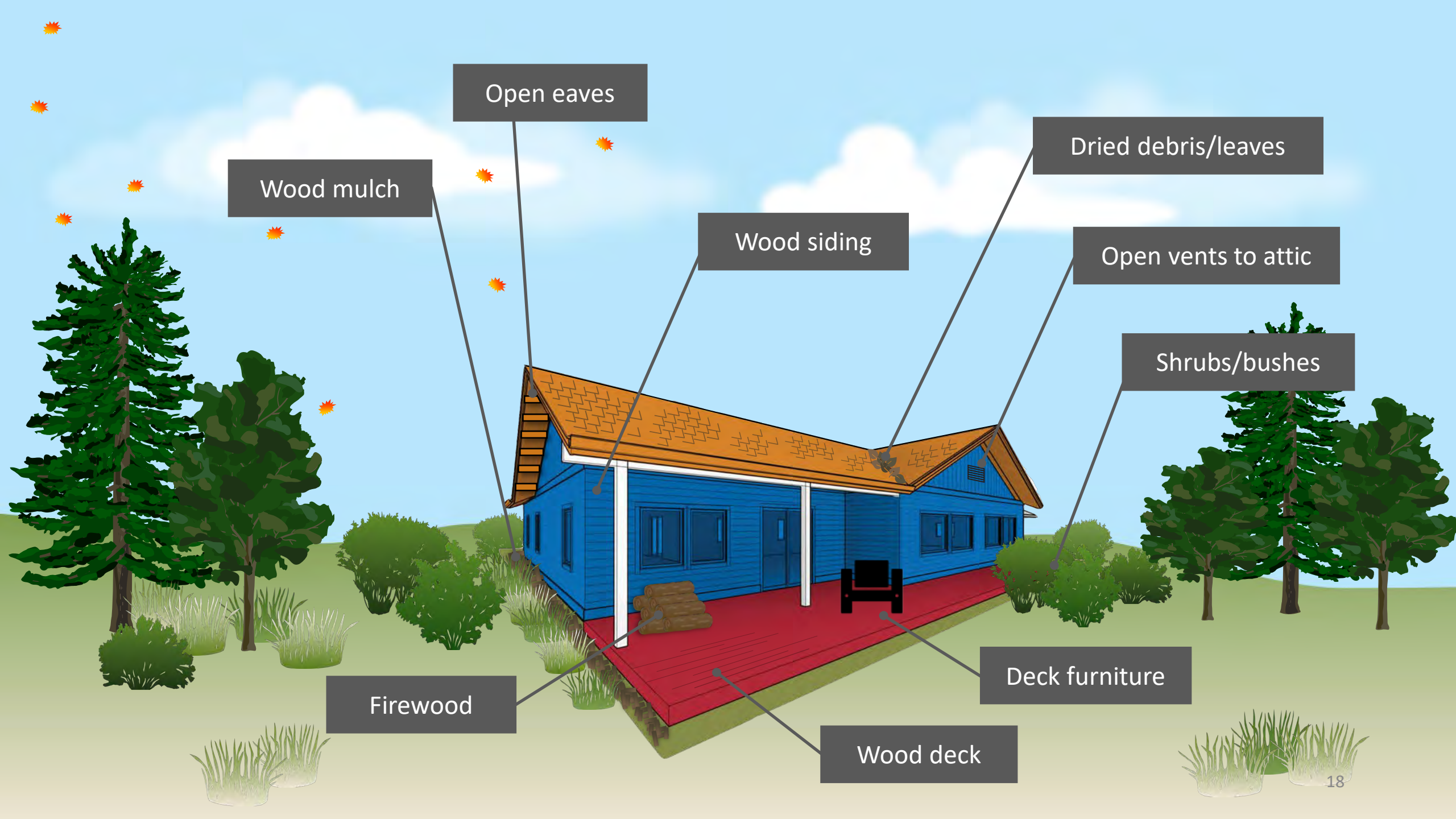






**Embers
(firebrands)**

The image shows a firefighter in the lower-left foreground, wearing a helmet and carrying a hose. A large fire is burning in the background, sending a massive, dense cloud of glowing orange embers and firebrands high into the night sky. The scene is illuminated by the intense orange and yellow light of the fire. The text 'Embers (firebrands)' is centered in the middle of the image, with eight yellow arrows pointing upwards from the text towards the base of the ember plume.



Open eaves

Wood mulch

Wood siding

Dried debris/leaves

Open vents to attic

Shrubs/bushes

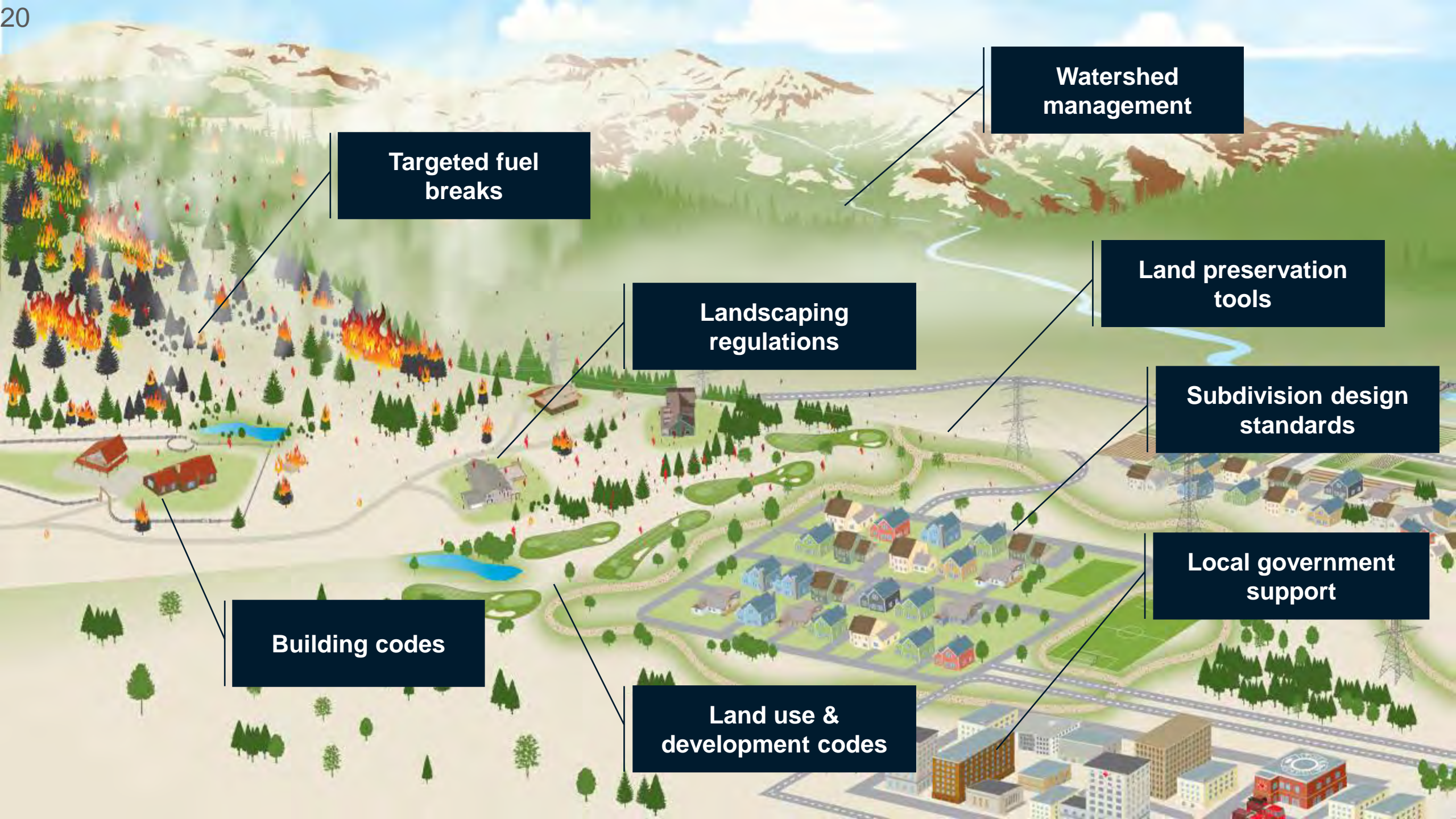
Firewood

Deck furniture

Wood deck

An aerial photograph of a forest fire. A large, intense fire is burning in the center of the frame, with bright orange and yellow flames rising from the ground and consuming some of the trees. Thick white smoke billows upwards from the fire. The surrounding forest consists of tall, green pine trees. A yellow line with a dot at the end points from a green callout box to a specific area of the forest. The callout box contains the text "Green vegetation".

Green
vegetation



**Watershed
management**

**Targeted fuel
breaks**

**Landscaping
regulations**

**Land preservation
tools**

**Subdivision design
standards**

**Local government
support**

Building codes

**Land use &
development codes**

Building Codes Improve Resiliency





FIRE DANGER

Holy S

#@\$!

TODAY

IFPL EL-1 WL-2

Chicago Fire, 1871





Kimiko Barrett, Ph.D.

406-224-1837

kimi@headwaterseconomics.org

<https://headwaterseconomics.org> | [@headecon](#)



*How fires work, how homes
ignite, and the impacts on
housing*

DANIEL GORHAM

Insurance Institute for Business & Home Safety

- Brings to [IBHS](#) a wealth of science and engineering experience in the wildfire peril.
- Most recently, Dan was the Research Project Manager for the [Fire Protection Research Foundation](#) in Quincy, Massachusetts. He has also spent time with the [National Fire Protection Association](#), was a Guest Researcher at the U.S. Forest Service Missoula Fire Sciences Laboratory, and a firefighter/EMT in the State of Maryland
- Master's and Bachelor's Degree in Fire Protection Engineering from the University of Maryland College Park.






WILDLAND FIRE, BUILDING IGNITION, AND COMMUNITY RESILIENCE

Daniel Gorham, P.E. – Research Engineer



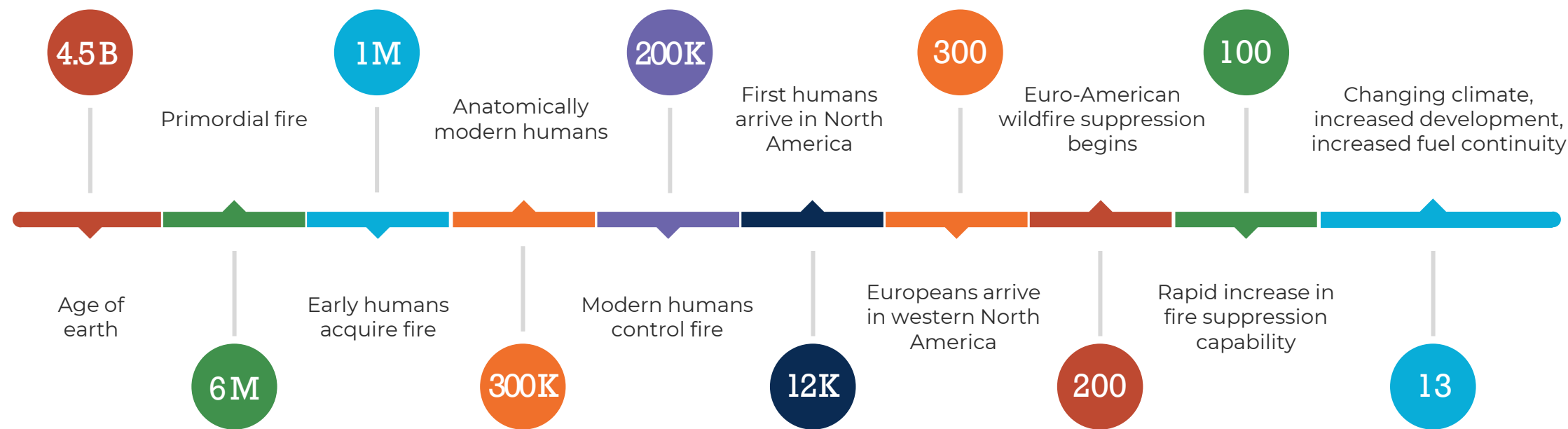
WILDFIRE

Losses from wildfire are increasing,
here's a look at how:

-  Population increase in Wildland Urban Interface (WUI)
-  Larger fires and increasing wind-driven ember threat
-  No longer a seasonal event



HISTORY OF FIRE IN THE ECOSYSTEM



● Years before present



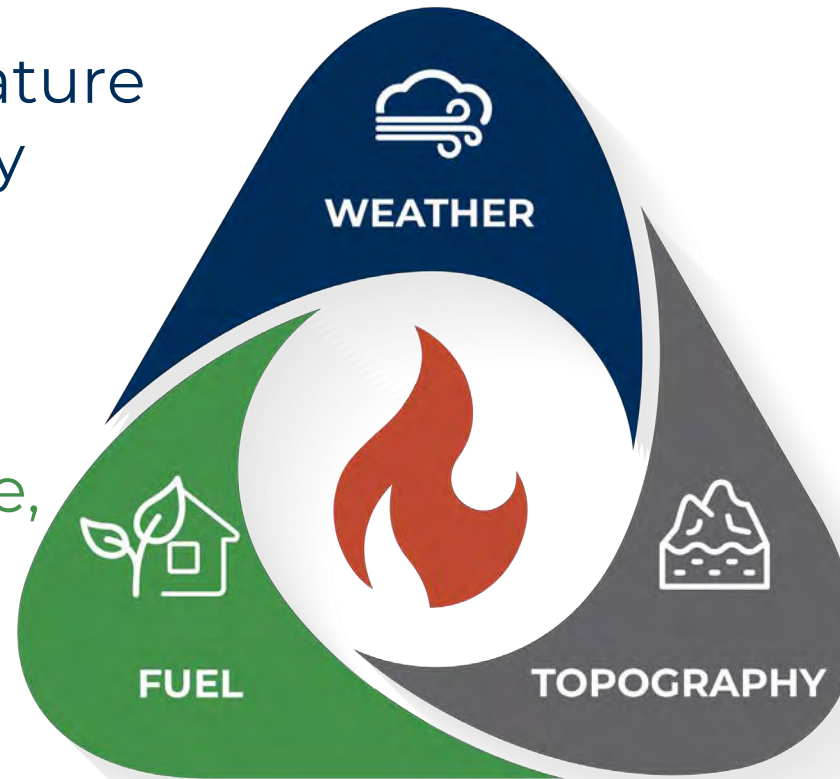
WILDLAND FIRE BEHAVIOR

Variable in time & space

- Wind
- Temperature
- Humidity

Variable in time & space,
controllable

- Type
- Amount
- Arrangement



Variable in space

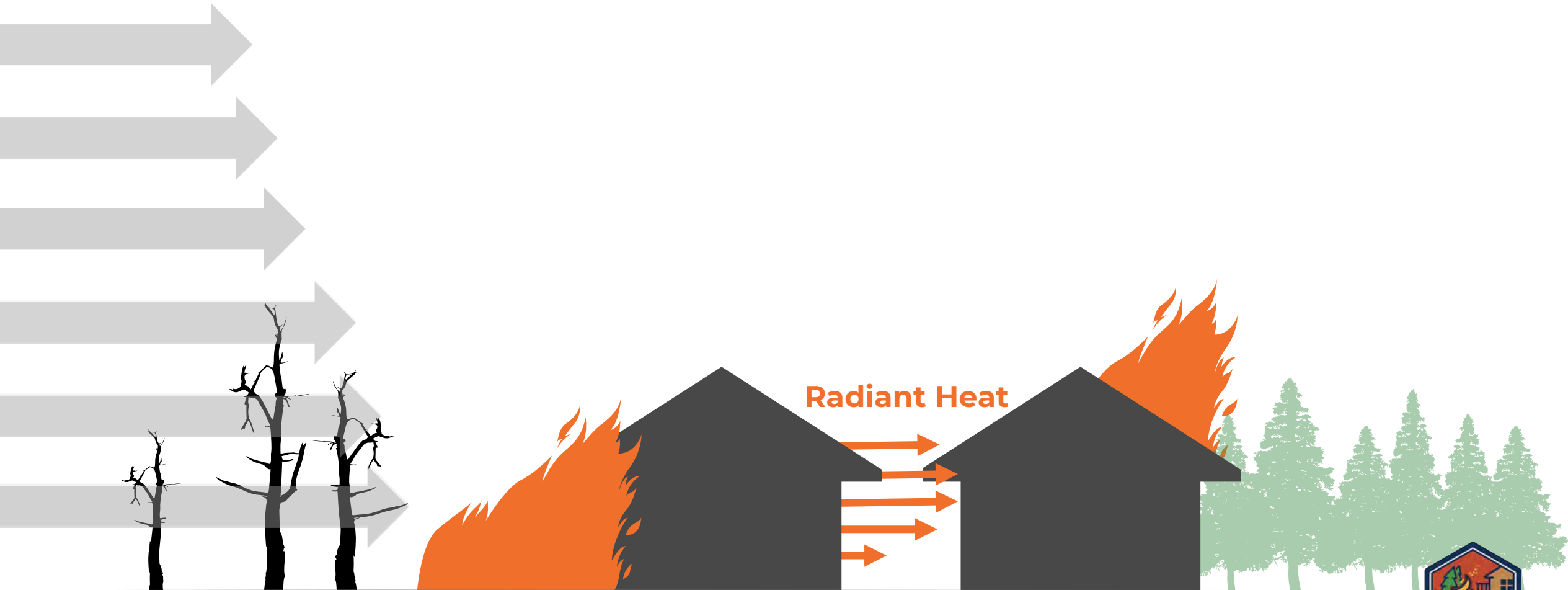
- Slope
- Aspect



FLAME CONTACT



FLAME RADIATION



EMBERS



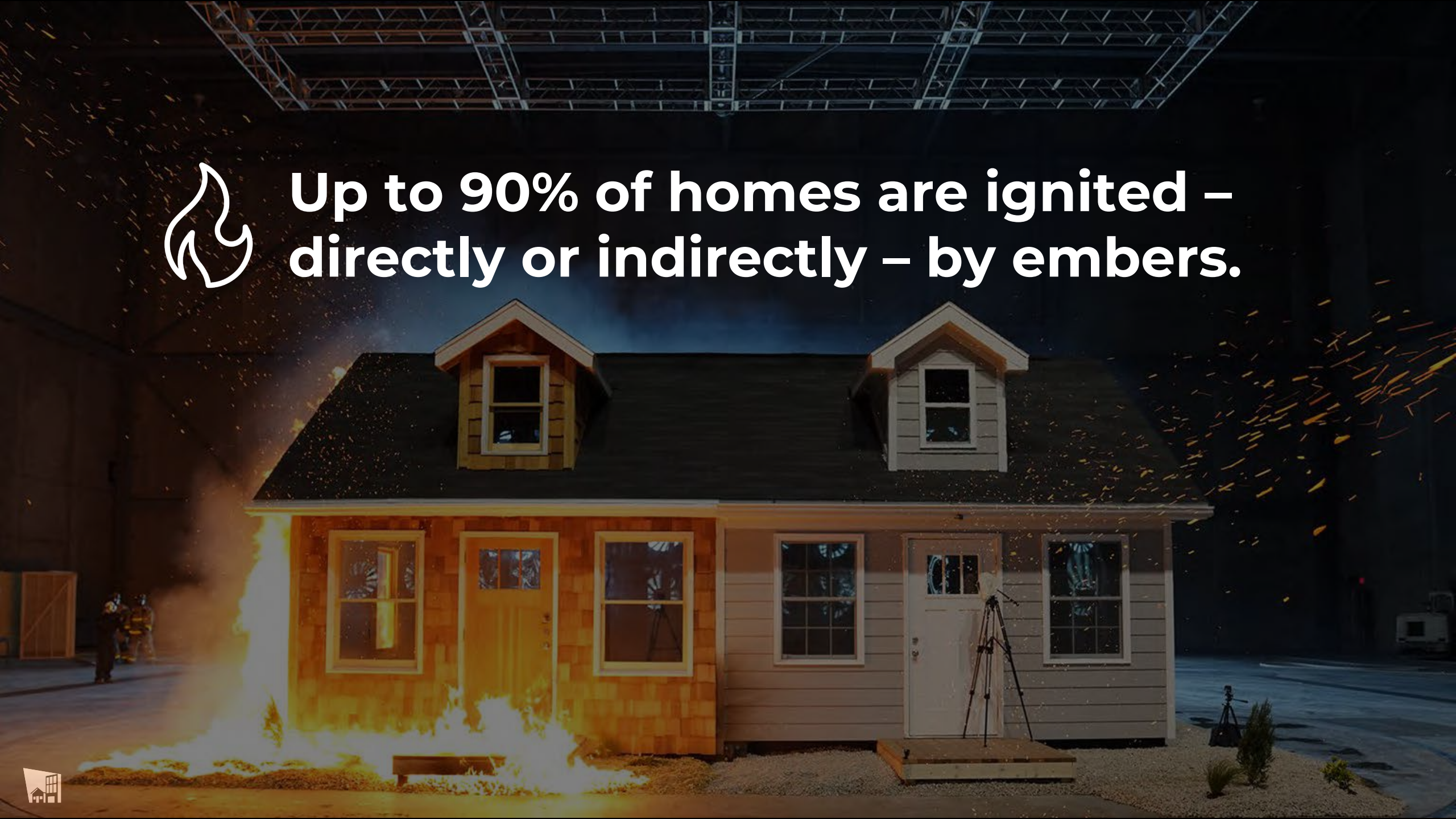


Ember deposition





**Up to 90% of homes are ignited –
directly or indirectly – by embers.**





**If a home is ignited by wildfire,
there is a 90 percent chance it will
result in a complete loss.**







Class A Roof Cover



Ember-resistant vents



Noncombustible attached fence



Maintain under-deck



0-5 Ft – Home Ignition Zone

5'







Daniel Gorham, P.E.
dgorham@ibhs.org
 @DanielJGorham





*Myths and facts on
defensible space and
vegetation management*

TODD LANDO

Central Marin Fire Department

- Battalion Chief and Wildfire Hazard Mitigation Specialist for Central Marin Fire Department with 31 years in the fire service.
- NFPA Certified Wildfire Mitigation Specialist and has worked as a fire inspector, an urban forester specializing in community wildfire protection, and served as Executive Director of Fire Safe San Mateo County and Fire Safe Marin - the nation's first and second fire safe councils.
- Studied Forestry and Wildfire Management at the University of Montana and earned a Bachelor's degree in Environmental Studies and Urban Planning from Sonoma State University.

Myth Busting

Defensible Space

*Separating fact from fiction
when it comes to defensible
space*

Todd Lando

Battalion Chief, Wildfire Hazard Mitigation Specialist
Central Marin Fire Department



DEFENSIBLE SPACE



Defensible Space & Wildfire Codes

Vegetation Management

CA Public Resources Code

- 4290-4291

CA Government Code

- 51187-51189

CA Fire Code

International Wildland Urban Interface
(WUI) Code

Local Ordinances

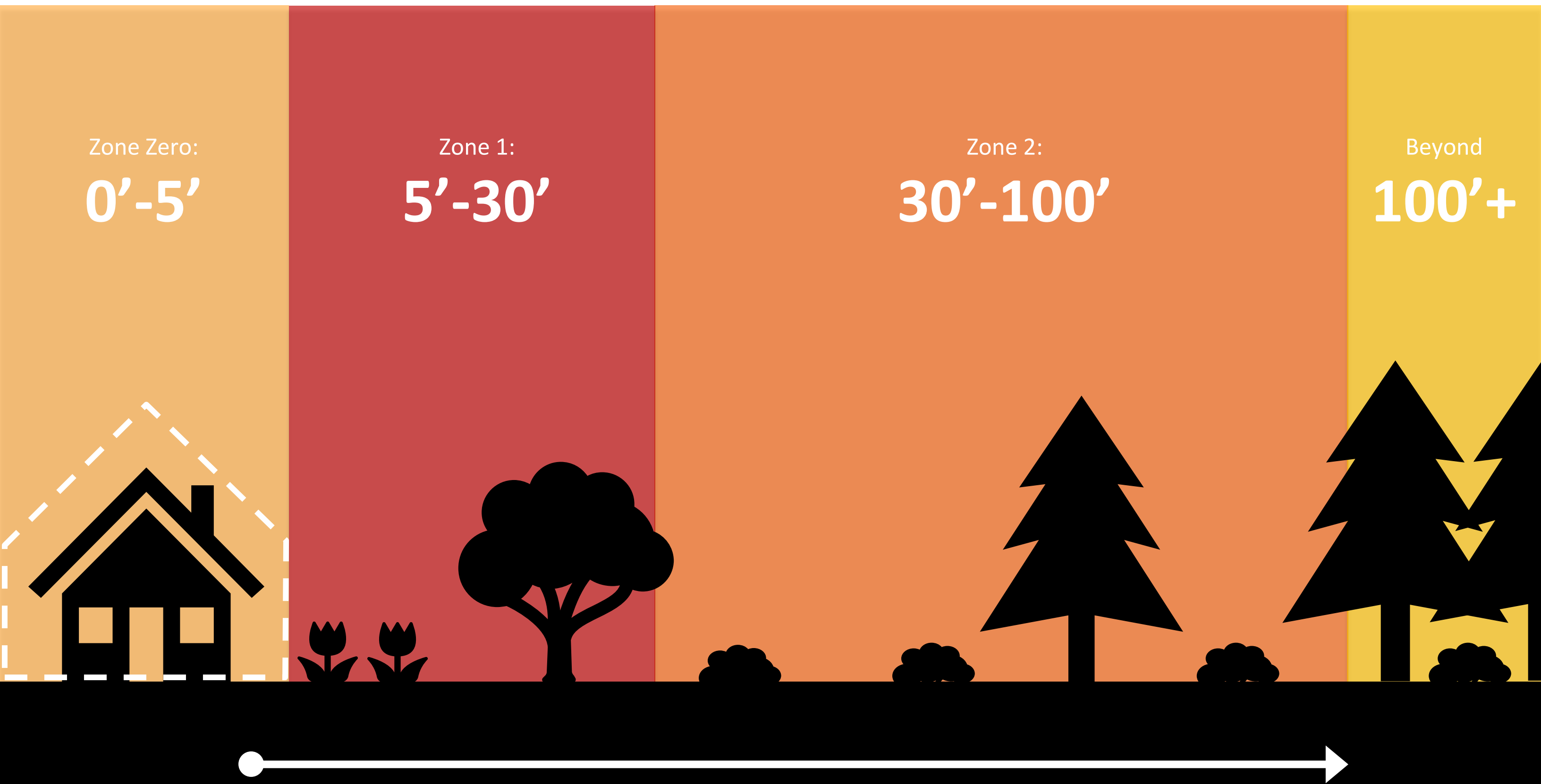
Building Construction

CA Building Code

- Chapter 7A



Defensible Space Zones



“Zone Zero”

0-5 feet

Ember Resistant

Non-Combustible



A dramatic night scene of a wildfire. A large, dark tree on the right side of the frame is engulfed in bright orange and yellow flames. The fire is intense, with thick smoke rising into the dark sky. In the foreground, a dense layer of glowing orange embers and sparks covers the ground, creating a textured, fiery surface. The background shows the silhouettes of other trees and possibly a building, all illuminated by the intense light of the fire. The overall atmosphere is one of danger and destruction.

60-90% of homes ignite from embers



Angorra Fire (2007) South Lake Tahoe



Tubbs Fire (2017) Santa Rosa, CA





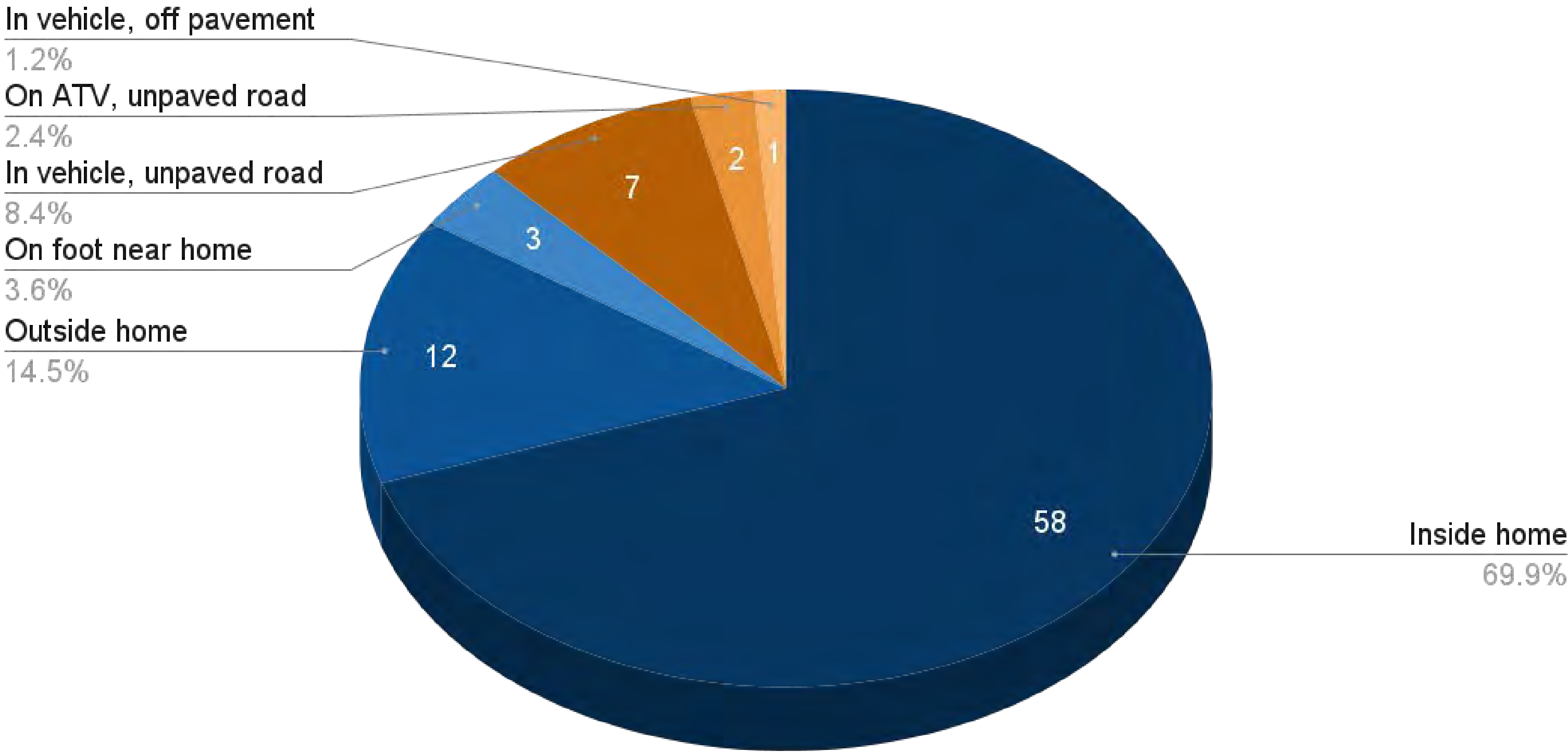


Myth

Traffic is deadly during wildfire evacuations.



2018 CAMP FIRE: 85 FATALITY LOCATIONS





Myth

My neighbor's tree is an extreme fire hazard!



Myth

My neighbor's tree is an extreme fire hazard!



Camp Fire (2018) Paradise, CA

Myth

All I (and/or my neighbor's) need to survive a wildfire is defensible space





Myth

I need to remove all vegetation to create defensible space



Myth

Defensible space is all about the types of vegetation I choose



FIRESCAPING =

Landscaping

+

Hardscaping



HEAT

Kincade Fire, Sonoma County, October 2019



Myth

Defensible Space will
ruin my landscaping



No, it wont

Defensible Space can
be attractive and
functional and **IMPROVE**
your landscape



Myth

If I clear all of the vegetation, I'll be safe.



Myth
Defensible space
means cutting down
trees!



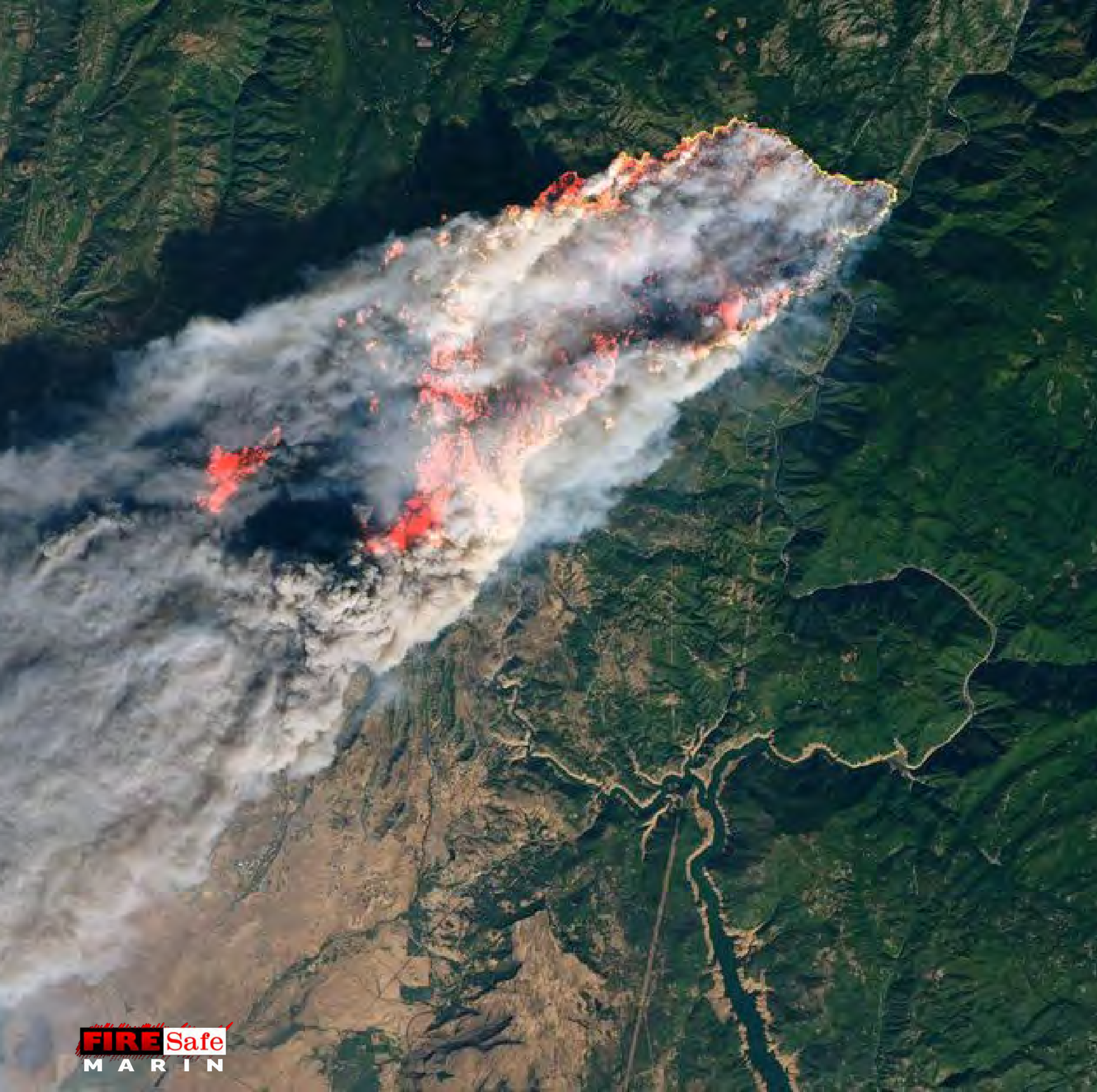
Myth

If the fire department just forced everyone to create defensible space, we'd all be safe!



Myth

**Defensible Space is
harmful to the
environment.**



Myth

I only need to worry about Defensible Space on “Red Flag” days.



*How the MWPA was
created, and its structure,
funding, & program
initiatives*

MARK BROWN

Marin Wildfire Protection Authority

- Started as a volunteer firefighter in 1986 in Sonoma County; hired by Marin County Fire Department as a Firefighter/Paramedic in 1991 and retired as the Deputy Fire Chief. Now Executive Officer for the Marin Wildfire Prevention Authority.
- Mark served on a CAL FIRE Incident Management Team for 15 years as a Type I Operations Section Chief and was qualified as a Type II Incident Commander. Founding member & Program Manager of the North Bay Incident Management Team, a Type III All-Hazards IMT in the SF Bay Area.
- Bachelor of Arts in Applied Studies - Organizational Leadership.



Changing the Wildfire Prevention Paradigm

ASSOCIATION OF BAY AREA GOVERNMENTS
September 30, 2021



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The Current Paradigm and Changing Environment



“Wildfire Grows Rapidly in California’s Lake County”
2015 Rocky Fire, Lower Lake, CA
Photo: Justin Sullivan, Getty Images

110 years of total fire suppression

- The US Forest Service “10 a.m. rule”—all wildfires completely out by 10 o’clock the next morning.

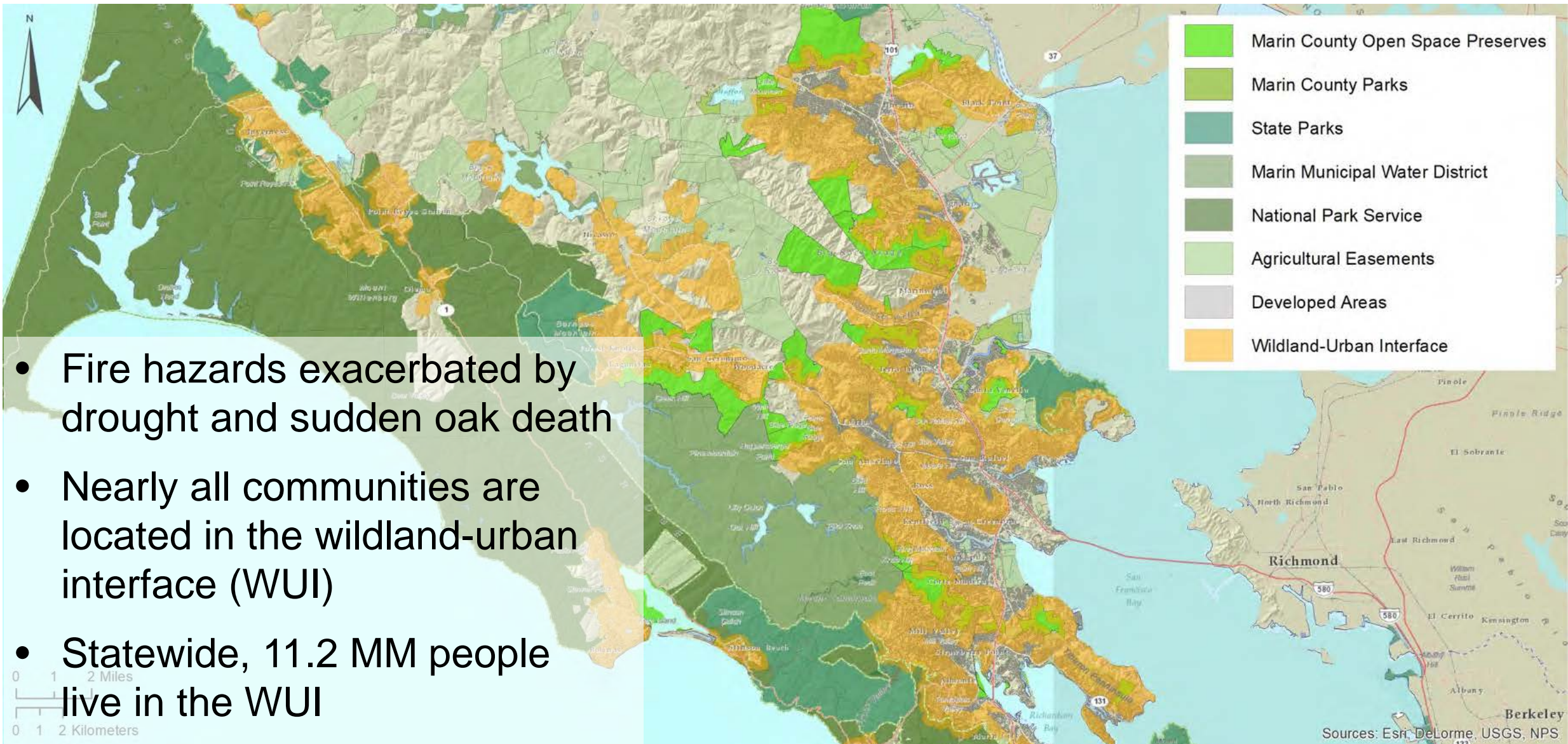


Photo: 1955_J R Eyerman/The LIFE Picture Collection, via Getty Images

Forests Have Become More Dense



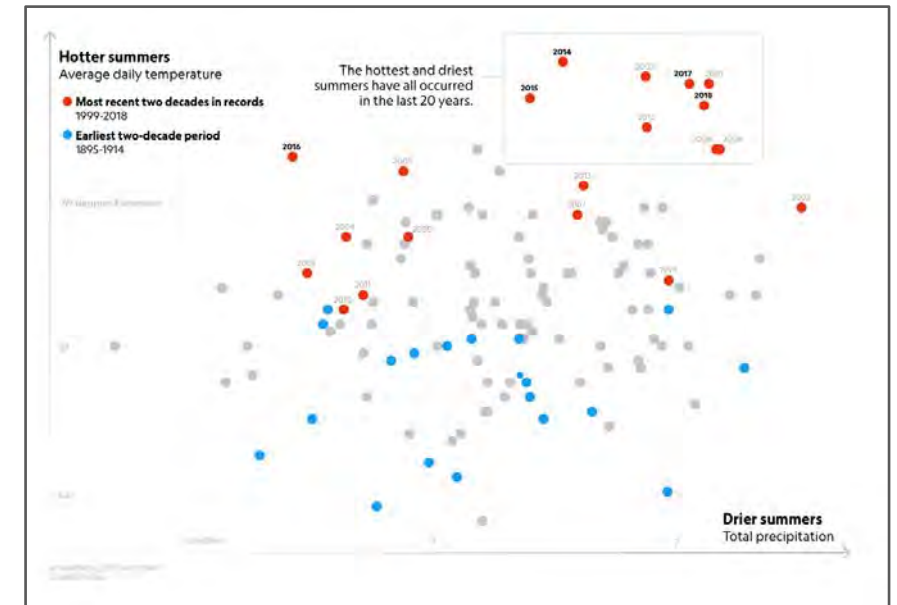
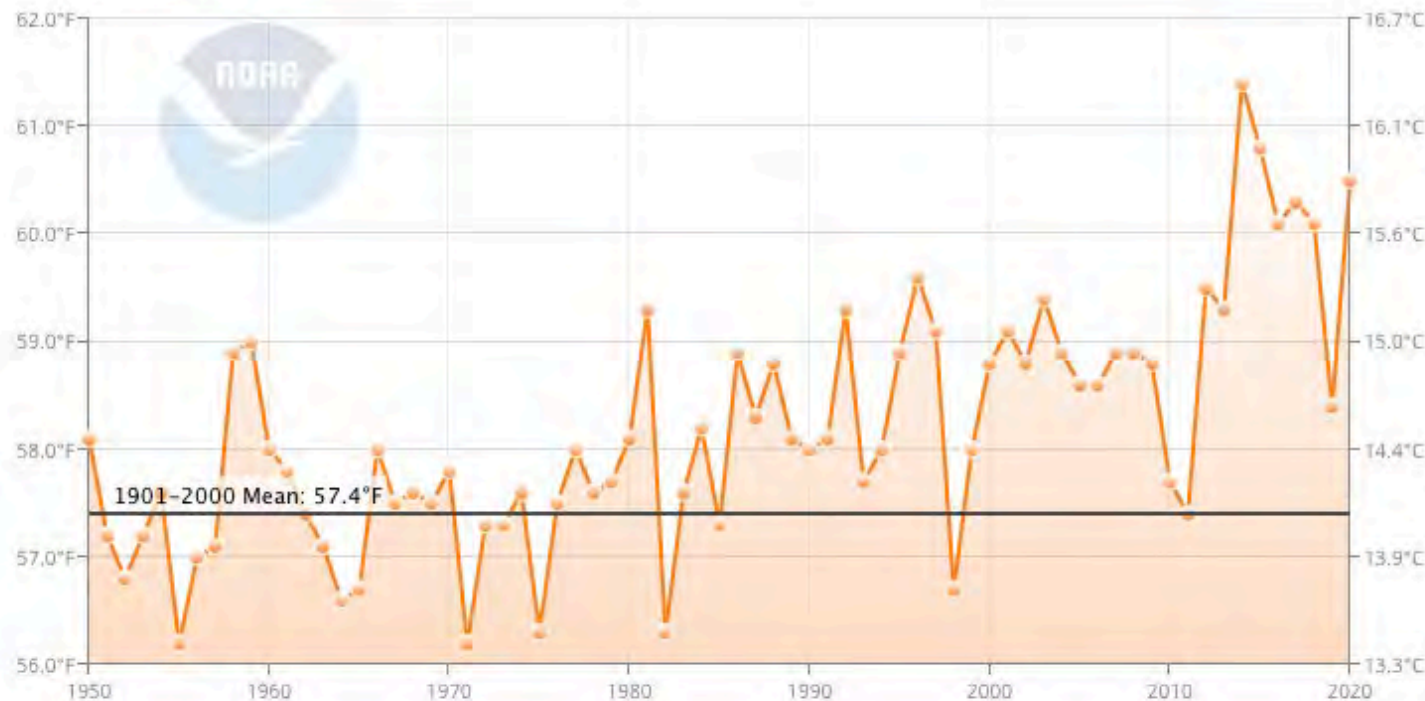
People Have Moved Further into Wildlands



Climate Change: Hotter, Drier, Longer



California Average Temperature
January–December



- The fire season has lengthened by 2–3 months since the 1970's.

SOURCES:

<https://www.ncdc.noaa.gov/cag/statewide/mapping>
<https://www.nationalgeographic.com/environment/article/climate-change-california-wildfire>

Working Independently



- 19 Independent Fire Agencies responsible for Fire Prevention and Suppression
- Fire knows no jurisdictional boundaries
- Compelling need to address common threats, mutual interests



Why Change the Paradigm? Lessons Learned.



2017 Tubbs Fire, Coffey Park, Santa Rosa, CA
Photo: CC-BY The National Guard



2018: Lessons Learned from the 2017 North Bay Fire Siege Report
"When fires started October 8th the only thing separating Marin County from their neighbors to the north was simply an ignition source."



2019: Marin Civil Grand Jury Report on Wildfire Preparedness
"...the creation of a joint powers authority to coordinate a comprehensive, consistent approach to pre-ignition planning."

Key Recommendations

- Form a Joint Powers Authority
 - No single agency exists to coordinate fire prevention efforts
 - Need to integrate county-wide prevention and risk reduction work
- Need an ongoing source of funding

The New Paradigm: A Fire-Adapted Community



“a knowledgeable and engaged community in which the awareness and actions of residents regarding infrastructure, buildings, landscaping, and the surrounding ecosystem lessens the need for extensive protection actions and enables the community to safely accept fire as a part of the surrounding landscape.”



- U.S. Forest Service

Dominant Paradigm	New Paradigm
“War on fire”	“Work with the flow” of natural processes
Wildfire is destructive	Wildfire is a necessary natural process
Control wildfire on the landscape	Learn to live with fire on fire-adapted landscapes
Prevent and suppress fires	Create fire-resilient human and natural communities
The problem is that wildfires are escaping our control.	The problem is that always suppressing natural wildfire is creating an unsustainable buildup of fuels which results in dangerous “unnatural fire.”
The solution is to apply existing procedures and technologies more strongly to bring fires under control.	The solution is to develop a more holistic approach to fire management where local communities, adjacent property owners, and governments work together to co-manage fire risk.



2016: Community Wildfire Protection Plan

“This document provides a framework for future collaboration that can be used to identify, prioritize, implement, and monitor hazard reduction activities throughout the county.”

- **Code Adoptions**
- **Fire Hazard Severity Maps**
- **Wildland-Urban Interface (WUI) ordinances**



**FIRE
SAFE
MARIN**

Adapting to Wildfire

- One of the nation's first Fire Safe Councils
- Public outreach and education, Firewise communities
- Trusted non-profit
- Existing relationships with relevant agencies

Public Safety Community



What are you already doing
in your communities?

What are your existing relationships
in your communities?

- Which agencies will be members of the JPA?
- Which non-members need to be consulted?
- What about the agencies that opt out?

- City Managers and Fire Chiefs built the format of the JPA and language
- Elected official oversight
- Standing for subject-matter experts
- Visits (times 2) to each board and council




The Process: Campaign & Election



- Civic leaders and Fire Chiefs campaigned Cities/Town Councils/Fire Districts for formation of a JPA
- JPA to be funded by **\$0.10/square foot parcel tax**
- **17 of 19 agencies** agreed to join
- **Measure C** – Marin Wildfire Prevention Authority received 70.8% voters' support in March 2020

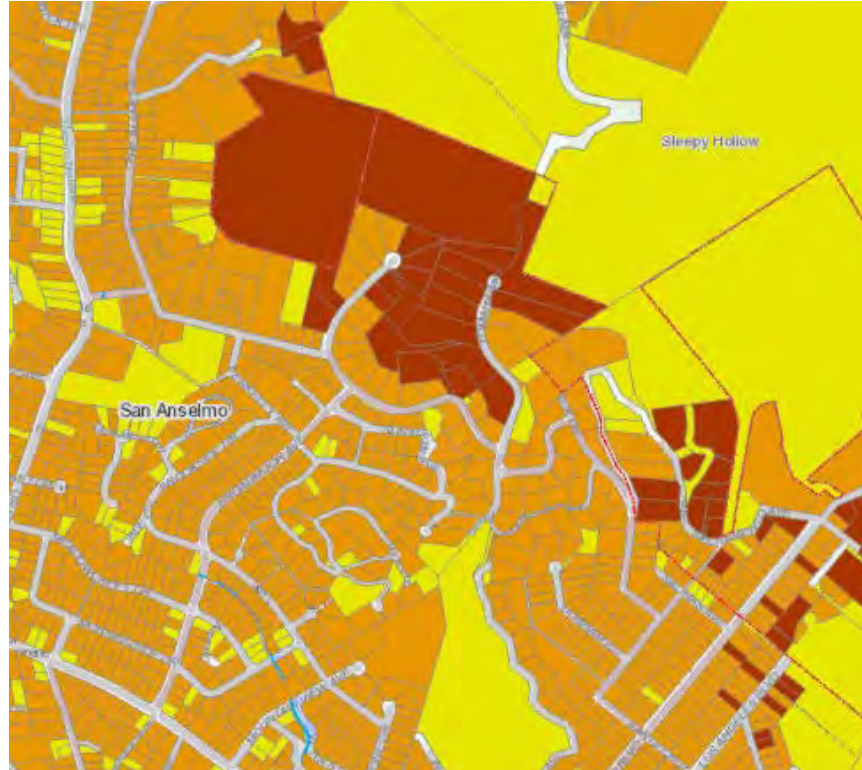
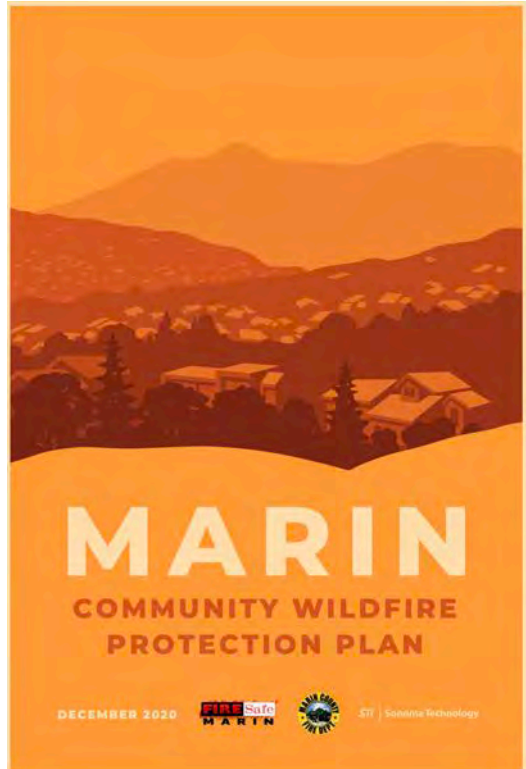


Marin County Measure C		
Result	Votes	Percentage
 Yes	75,638	70.80%
No	31,200	29.20%

Setting Up the Marin Wildfire Prevention Authority



KQED: "This California Neighborhood Was Built to Survive a Wildfire. And It Worked."
2007 Witch Fire, Crosby Neighborhood, Rancho Santa Fe
Photo: Don Bartlett, Los Angeles Times via Getty Images



Marin County CWPP: Provides county-wide framework for MWPA's annual work plans and investments—updated annually.

- **LIDAR data:**
funded by a 2019 federal grant
- Conducted a **Fire Risk Assessment for every parcel and home** in Marin
- Identifies **critical hazards & investments needed to reduce risks**

The Marin Wildfire Prevention Authority leads the development of fire adapted communities using sound scientific, financial, programmatic, ecological practices, vegetation management, community education, evacuation and warning systems with the support of its member and partner agencies.

Land Managers

Manage landscapes for lowered fuel loads, lower fire intensity and ecological resiliency to fire.

Marin Residents

Modify homes to be more fire resistant. Be prepared and subscribe to alerts.

Civic Leaders

Develop laws and policies in support of fire prevention, preparedness and risk reduction.

First Responders

Craft fire prevention, preparedness, and emergency response plans. Educate community.

Developers & Business Owners

Don't build in high-risk areas. Build with fire-resistant materials.

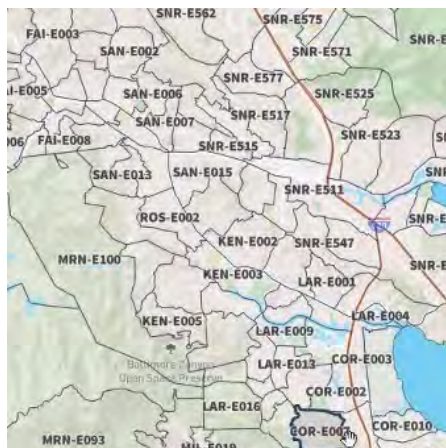


Leading the Development of a Fire-Adapted Marin



Reduce Wildfire Fuels

Vegetation Management and Local Wildfire Prevention Mitigation



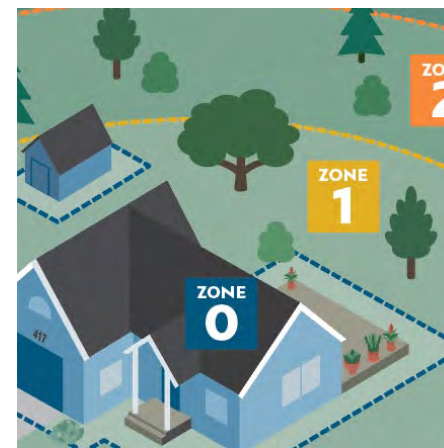
Improve Evacuation Systems

Wildfire Detection, Alert, and Evacuation Program Improvements



Reduce Risks to Homes

Defensible Space Evaluations (1/3 annually) and Home Hardening



Educate the Public

Public outreach and education about fire prevention, preparedness, and risk reduction



Provide Grants to Residents

Grants to modify homes and partnerships to collaborate and augment funds

MWPA: Organizational Structure



- A **Joint Powers Agreement** clearly defines the JPA's authorities to operate, act and invest in wildfire prevention activities
- Operated "**From the Ground Up**"
- All sub committees' actions are defined by written **Bylaws**
- All actions and investments are **monitored by a Citizens' Oversight Committee**
- We are now one year old

MWPA: Geographic Zones



17 agencies with different level of work backlog, resources available, community support



**JPA Operational Boundaries:
5 Geographic Zones**



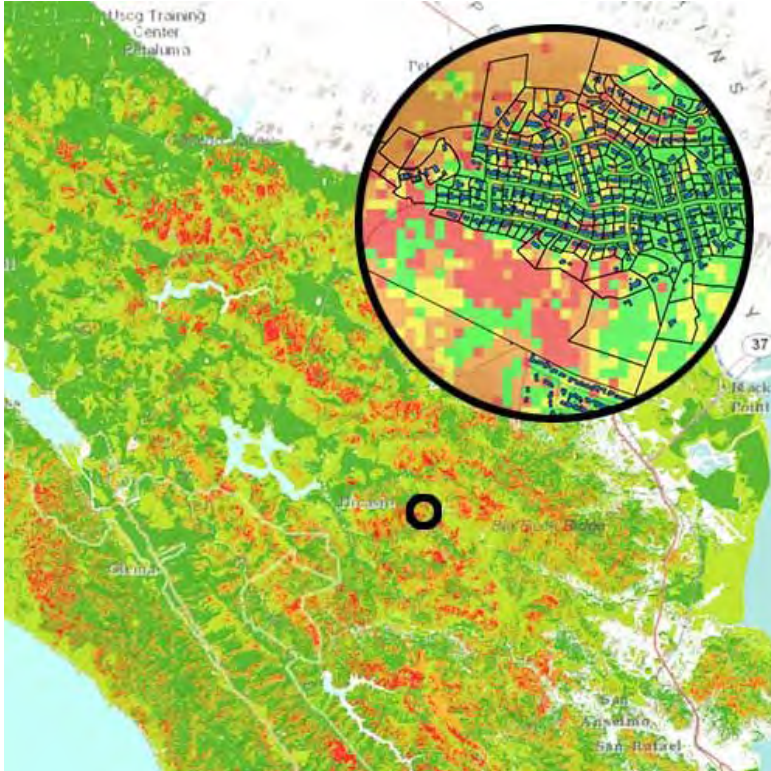
Program Area	% of funds
JPA Core: Cross-Jurisdictional Projects Wildfire Detection & Evacuation Program Improvements, Veg Management/Fire Hazard Reduction, Grants Management, Public Education (Fire Safe Marin)	60%
Defensible Space Evaluations and Home Hardening (agencies can administer)	20%
Community-Level Wildfire Prevention Mitigation Local jurisdiction fire prevention issues with no funding. Enhanced fire patrols for problem areas, additional fire hazard reduction work, evac route parking issues	20%

2020-2030: **10-year term**

~\$20 MM revenue per year

Year 1: Creating the
framework for MWPA while
implementing work on the
ground

Emphasizing importance of individual homes in preventing disaster



Parcel-level data




Harden Homes



Defensible Space

Grants to help low-income residents and those with access and functional needs to get it done



 WEBINAR

**EVACUATIONS
& WARNINGS:
HOW TO SURVIVE
A WILDFIRE**

Tuesday, August 25 @ 6pm



Evacuation Route Clearing



BEFORE



AFTER



Zonehaven

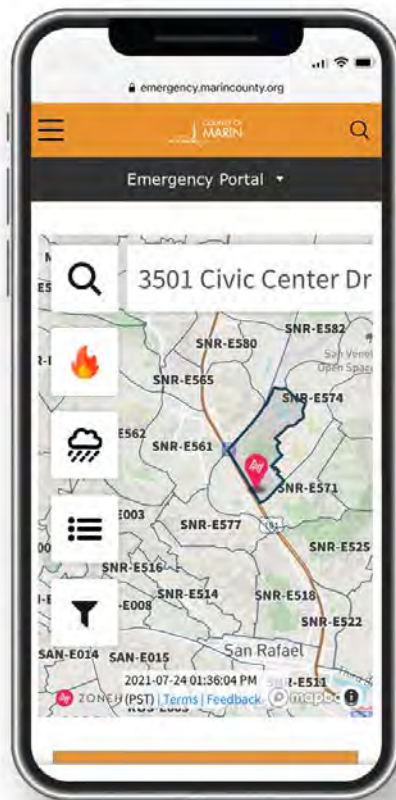
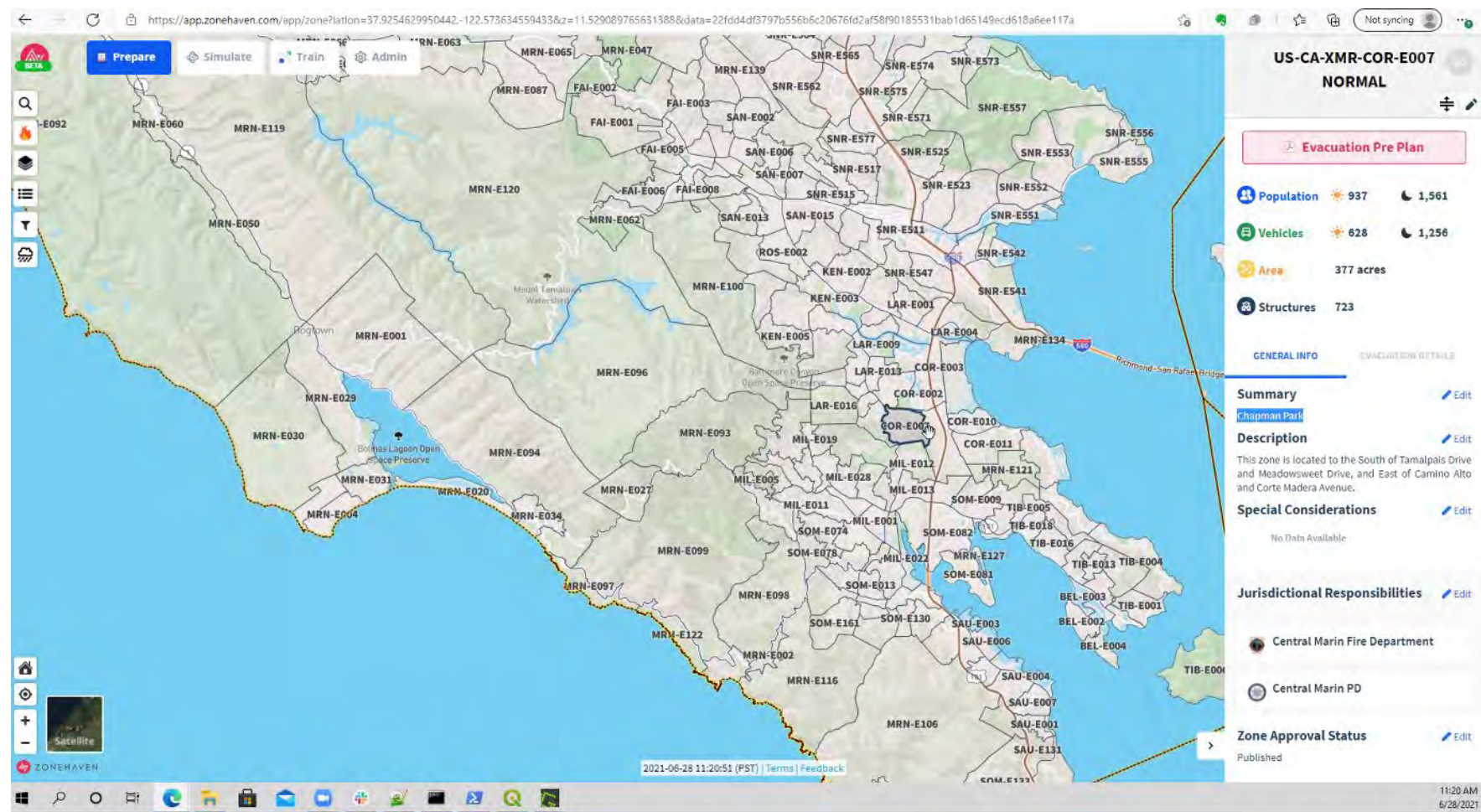




Photo: Alan Dep, Marin Independent Journal
Lassen Fire, September 2021, San Rafael, California

- Ingress/egress risk assessment
- App development: Fire risk analysis to help prioritize projects
- Roadway terrain and condition
- Traffic patterns
- Number of cars
- Pinch points
- Sync traffic preemption devices (i.e. green lights in a certain direction)
- Demographics of community (such as access and functional needs)

Local Fire Prevention/Mitigation Projects



Goat Grazing



Shaded Fuel Breaks



Mount Burdell Open Space Preserve
2020 End of Year Report, Marin County Parks

Thank You

Mark Brown
Executive Officer
Marin Wildfire Prevention Authority

www.marinwildfire.org

415-539-6972

Questions & Answers

- ✓ Use the **Chat** feature to share specific questions.
- ✓ Use the **Raise Hand** feature to verbally share ideas from your community or raise more difficult questions.

Be considerate of others - keep your comments and questions focused.

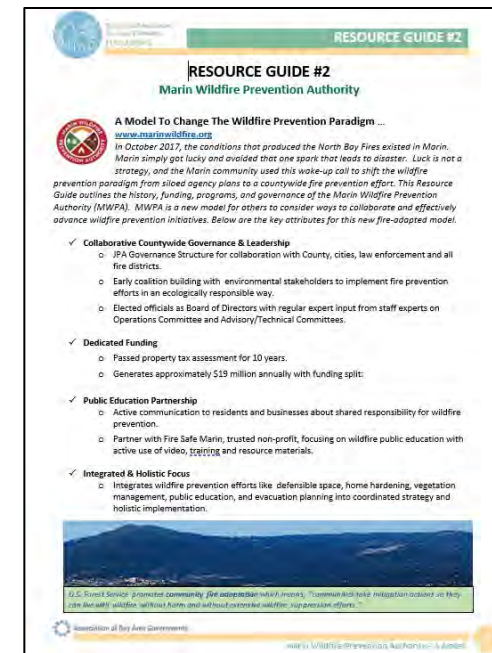
SESSION 1 - Resource Guides

✓ Guide #1 -Wildfires - Research, Science & Key Organizations

Resource list to key research and organizations regarding wildfires and housing.

✓ Guide #2 - Marin Wildfire Prevention Authority (MWPA)

Overview of MWPA including history, structure, governance, funding and programs.



10/14 Speakers

STEPHEN QUARLES, Ph.D.

UC Cooperative Extension Advisor
emeritus & Chief Scientist for Wildfire
and Durability,
IBHS (retired)



*What is home
hardening and
science behind why it
works.*

YANA VALACHOVIC

County Director - Forest
Advisor for the UC Cooperative
Extension in Humboldt and Del
Norte Counties



*What is defensible
space and science
behind why it works.*

STEVEN HAWKS

Staff Chief - CAL FIRE
Wildfire Planning and
Engineering Division



*Overview of CAL FIRE
resources for home
hardening and
defensible space.*

RICH SHORTALL

Executive Coordinator -
FIRESafe Marin



*Overview of FIRESafe
Marin resources for
home hardening and
defensible space.*

Conclusion

Remember the Resource
Guides

Flash Survey



See you on 10/14!

