

WILDFIRE RESILIENCY CODE BOARD
Update to Fire Adapted Colorado
Snowmass Village
3 October 2024



COLORADO
Wildfire
Resiliency
Code Board

**To best understand SB-166,
it is important to understand it's history.**



Recent Wildfire in Colorado

- 2022 NIFC Federal Summary
 - 835 wildfire incidents; 625,000 acres burned in Colorado
- 2021 Marshall Fire
 - 1,084 homes lost ; 6,026 acres burned
 - Colorado’s most destructive fire by homes lost
- Property intelligence firm, CoreLogic, ranks Colorado in the top 5 riskiest housing markets for wildfire damages.



Marshall Fire - 2022
Photo courtesy: The Coloradoan



An Act

SENATE BILL 19-040

BY SENATOR(S) Hisey and Fields, Bridges, Coram, Crowder, Danielson, Donovan, Gardner, Ginal, Gonzales, Lundeen, Marble, Pettersen, Rankin, Story, Tate, Todd, Williams A., Winter, Woodward, Garcia; also REPRESENTATIVE(S) Carver and Roberts, Arndt, Bird, Buckner, Buentello, Cutter, Duran, Esgar, Exum, Galindo, Geitner, Gray, Herod, Hooton, Kipp, Kraft-Tharp, Larson, Lontine, McCluskie, McLachlan, Michaelson Jenet, Singer, Sirota, Snyder, Titone, Valdez A., Valdez D., Will.

CONCERNING THE ESTABLISHMENT OF THE COLORADO FIRE COMMISSION, AND, IN CONNECTION THEREWITH, MAKING AN APPROPRIATION.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. In Colorado Revised Statutes, add 24-33.5-1233 as follows:

24-33.5-1233. Colorado fire commission - creation - powers and duties - report - legislative declaration - repeal. (1) Legislative declaration. (a) THE GENERAL ASSEMBLY HEREBY FINDS THAT:

(1) THE DIVISION HAS ENGAGED IN A TWO-YEAR,

The Polis administration therefore requests that the Colorado Fire Commission evaluate and present options to the Governor's Office on a statewide approach to land use planning, development, perimeter defense, and building resiliency in the WUI, with a particular eye toward the large increases in new development and population expected in the WUI in the near-term. The Commission should consider both regulatory and incentive-based solutions for safer and smarter development, while also evaluating the need for statutory changes. In order to meet the challenges facing our State, it is important that this process be conducted expeditiously. We respectfully request that the Commission provide a range of options no later than September 30th, 2021.

Thank you for your continued service and commitment to the State of Colorado.

Sincerely,



Jared Polis
Governor

Before we discuss SB23-166, there's another bill from 2019 that we should probably discuss. On July 8, 2021, the Commission received a letter from the Governor that set things in motion.



“A Supermajority of voting CFC members voted in support of the creation of a WUI Code Board and in support of Recommendation 22-01 at the April 12, 2022 CFC meeting.”

Colorado Fire Commission (CFC) – Wildland-Urban Interface (WUI) Subcommittee
Recommendation 22-01- FINAL

A supermajority of voting CFC members voted in support of the creation of a WUI Code Board and in support of Recommendation 22 – 01 at the April 12, 2022 CFC meeting.

RECOMMENDATION

Create a Wildland-Urban Interface (WUI) Code Board (WUI Code Board) responsible for adopting a minimum code based on wildfire hazard.

IMPLEMENTATION TIMEFRAME

- The WUI Code Board will have up to 24 months to adopt a minimum code, allowing time to seat the Board members (3+ months), develop policies and procedures of the Board (3+ months), and hold hearings on code adoption (12+ months).
- The WUI Code Board would determine the timeframe for code implementation. One year for implementation is the suggestion from the WUI Subcommittee, as one year allows communities time to come into compliance.

SCOPE

- Vacant land
- Existing buildings (no renovations)
- Existing buildings with major retrofits
 - The WUI Code Board will determine what constitutes a major retrofit. Suggestions for what constitutes a major retrofit from the WUI Subcommittee include exterior remodels to existing structures requiring a building permit or a valuation of the work done in relation to the property's value.
- New construction
- Land use planning for subdivisions

After a very robust stakeholder process, the WUI Subcommittee made a recommendation to the main Committee.



With the Passage of SB23-166, the Colorado Wildfire Resiliency Code Board was Established

Establishes a Wildfire Resiliency Code Board that is required to promulgate rules concerning the adoption and administration of codes and standards for the hardening of structures and parcels in the wildland-urban interface in Colorado

The board consists of **21 appointed voting members** with specific government or industry qualifications and **3 non-voting members**, representing 3 State agencies. Appointments are **3-year terms**, with the exception that two-thirds of the initial appointments will be staggered. Members may be appointed for **one additional term**.



COLORADO
Wildfire
Resiliency
Code Board



Board Responsibilities

- Defining the wildland-urban interface and identify areas of the state that are within it;
- Adopting minimum codes and standards based on best practices to reduce the risk to life and property from the effects of wildfires;
- Identifying hazards and types of buildings, entities, and defensible space around structures to which the codes apply; and
- Establishing a process for a governing body to petition the board for a modification to the codes and establish the criteria and process for the board to grant or deny an appeal from a decision of the board on a petition for modification.

Definitions

WUI Definition agreed upon by WRCB:

“That geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels.”

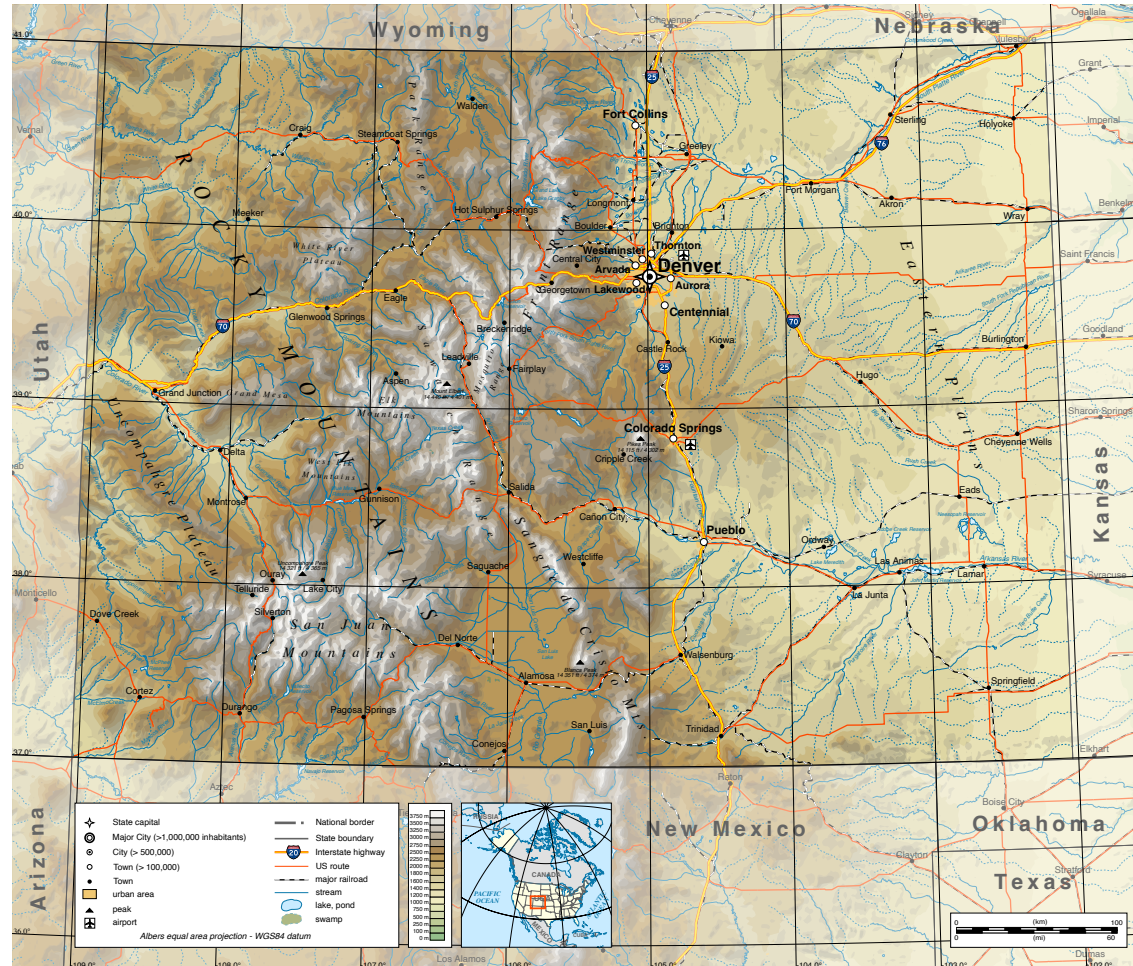




COLORADO
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WRCB: A CODE FOR COLORADO

- Board meetings are public, so plan to attend regularly and often (2nd Fridays)
- Several Board positions are reserved for Code Professionals. If you are interested in serving and were not selected for an initial appointment, appointments are not permanent.
- Code adoption accomplished through rulemaking process – provide public comment when necessary.



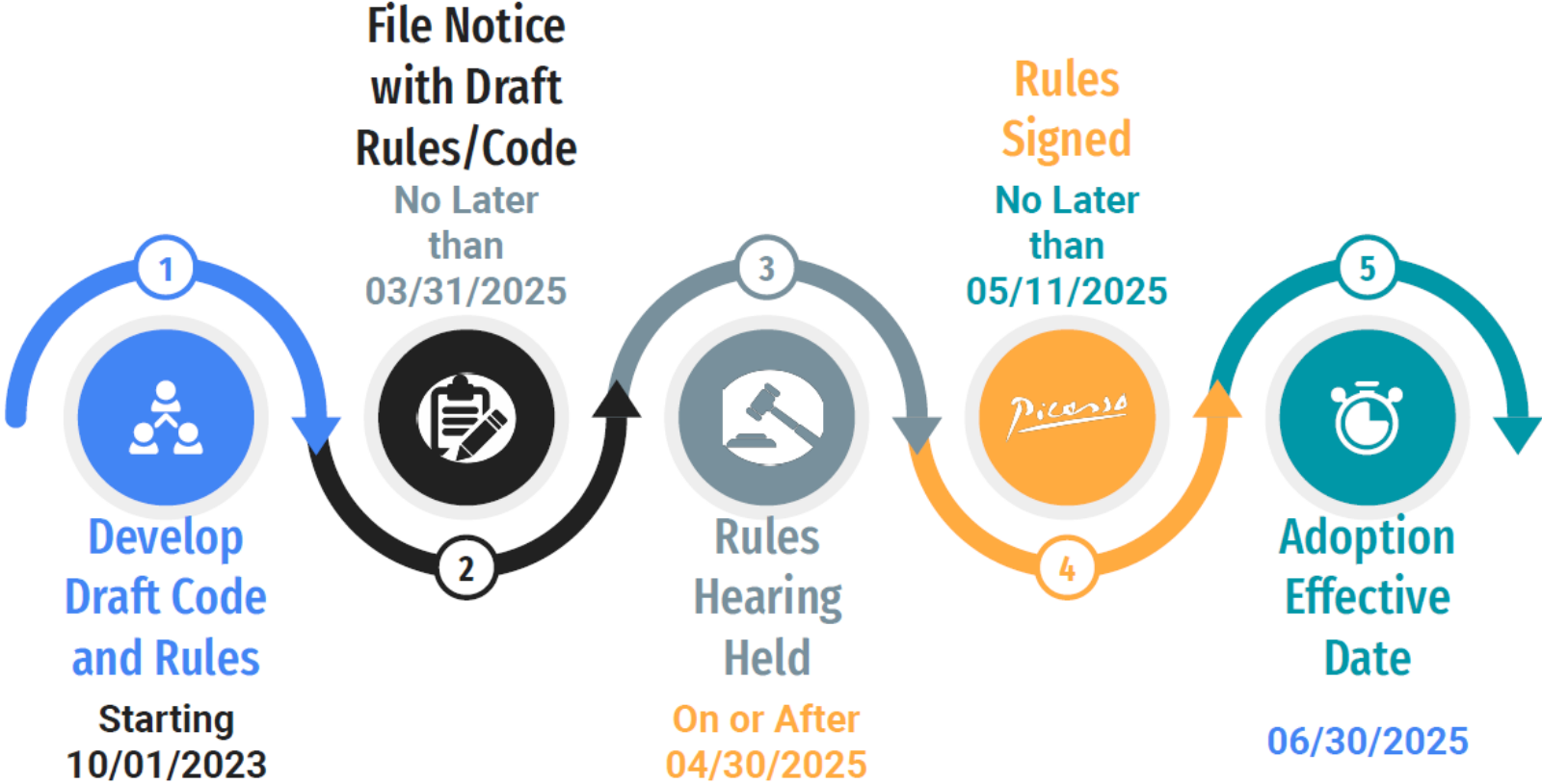
COLORADO
Division of Fire
Prevention & Control
Department of Public Safety



COLORADO
Wildfire
Resiliency
Code Board



Colorado Wildfire Resiliency Code Adoption Timeline*

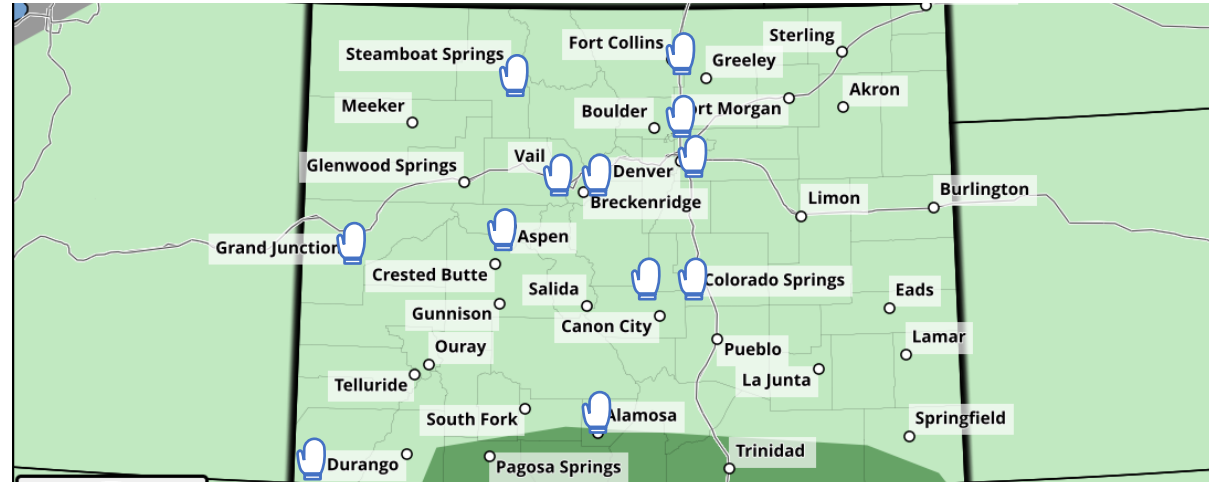


*Normal Rulemaking Process



The Board Convened for its First Meeting on: OCTOBER 20, 2023

Frisco, October 2023
Colorado Springs, December 2023
Johnstown, January 2024
Woodland Park, February 2024
Idaho Springs, March 2024
Denver, April 2024
Steamboat Springs, May 2024
Grand Junction, June 2024
Snowmass Village, July 2024
Durango, August 2024
Alamosa, September 2024



Ft Collins, October 2024
Eastern Colorado, November 2024

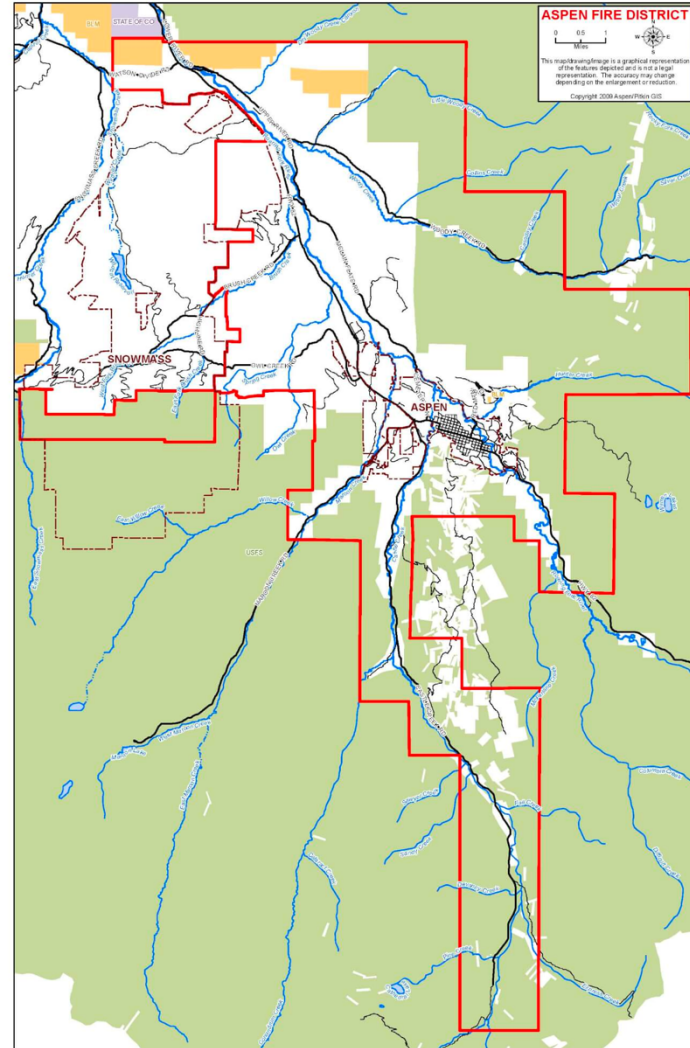


ASPEN FIRE DISTRICT

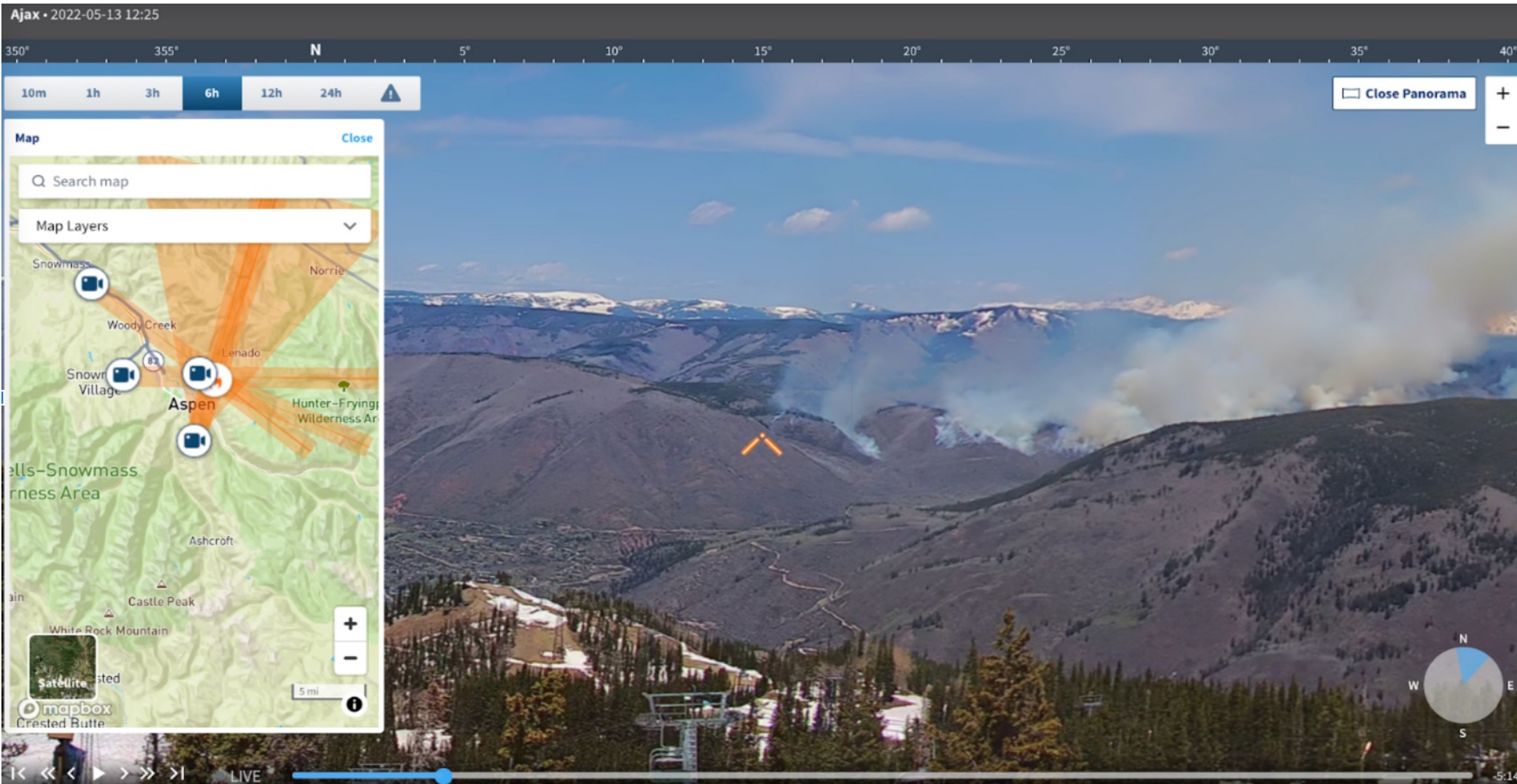
**\$55.2 Billion in assessed
property value**

5 firestations

**87 square miles
(55,680 acres)**



WILDFIRE TECHNOLOGY : SMUGGLER BURN



WILDFIRE TECHNOLOGY : HIGHLAND CAMERAS

360.pano.ai

PANO for Government

View Panos

INCIDENTS STATIONS

Search incident ID number, county, etc.

- Highland Fire (Incident ...)** Active for 4h
#199349 • Aspen, Pitkin
Ajax • Upper Red Mountain
- Closed Incident** Closed for 10d
#192958
Jack Rabbit
- Closed Incident** Closed for 18d
#189274
Jack Rabbit
- Incident #188284 from S...** Closed for 22d
#188290
Sunlight Mountain
- Closed Incident** Closed for 22d
#187965
Sunlight Mountain
- Closed Incident** Closed for 27d
#186015
Lookout Mountain Park
- Closed Incident** Closed for 35d
#185518

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mapbox 2mi

Layers

Satellite



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Progress: Definition and Mapping



WUI Definition agreed upon by WRCB:

“That geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels.”

After extensive research and comparison, by the WRCB, of State Wildfire Hazard/Risk mapping and other products such as:

- California Dept. of Forestry’s Fire and Resource Assessment Program(FRAP) Mapping
- Oregon Dept. of Forestry’s (ODF) Wildfire Hazard Map
- Colorado Jurisdictions currently using other wildfire risk mapping products

Colorado Wildfire Risk Assessment Mapping (CO-WRA)

The WRCB voted to utilize the Colorado Wildfire Risk Assessment (COWRA) as a reference tool for helping to establish the areas within Colorado that are situated in the Low, Medium or High hazards zones of the WUI as defined with the expectation that there will be exceptions that there may be exemptions to the code for certain areas that are currently under review by the WRCB Strike Force for “Implementation and Mapping” that will be subject to full WRCB for review and approval.

Also under review is the option for AHJ’s that currently have, or may have in the future, their own map in place the ability to utilize their jurisdictions map and the process for validation and maintenance of local or regional hazard map.

In addition, WRCB is exploring Wildfire Hazard Mitigation Professionals (certification)



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Summarizes the potential fire intensity under “**high**” to “**extreme**” weather conditions.

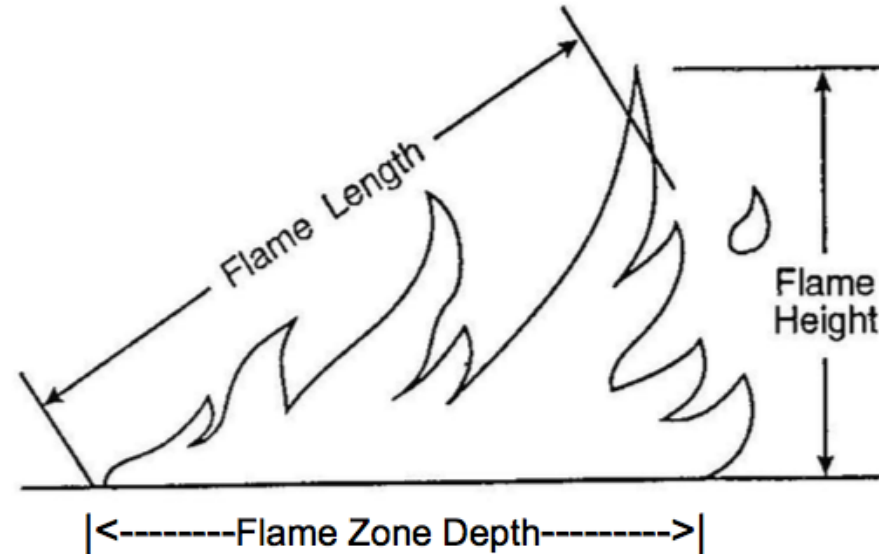
Relative Humidity: extreme weather scenario (3rd percentile) in a 40-year period (1979-2022)

Weather: extreme weather scenario (97th percentile) in a 40-year period (1979-2022)

Wind: weather data for the extreme weather scenario (97th percentile) in a 40-year period (1979-2022)

<http://www.wildfireanaylst.com/>

Fire Intensity Basics



A scale that describes the potential level of a wildfire, with low, moderate, high, and extreme intensity levels. Low intensity fires have low flames that stay close to the ground, while extreme intensity fires have very high flames that spread quickly and are hard to predict.





Fire Hazard Intensity Models / Mapping

Three Parameters make up most Fire Hazard Severity:

- **Fuels**
- **Critical Fire Weather Frequency**
- **Slope**

Fireline intensity is a crucial metric for gauging how likely a fire is to spread, how challenging it will be to control, and the potential damage to vulnerable structures or development. Fire Intensity plays a significant role in our upcoming code development and defining the WUI.



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Forest Atlas Fire Intensity

Technosylva's Wildfire Analyst software uses the following input datasets:

- | | |
|----------|---|
| Fuels | 1. Fuels (surface and canopy characteristics) |
| Critical | 2. Live and fuel moisture |
| Weather | 3. Temperature and Relative humidity |
| | 4. Wind speed and direction |
| Slope | 5. Elevation |
| | 6. Slope |
| | 7. Aspect |



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Forest Atlas Fire Intensity

- Fire Intensity Scale:
- Similar to the Richter scale for earthquakes, this method of quantifying fire intensity is easily understood by the public and non-scientific users.

Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography – and the spread itself (back, flank or head fire influences fire behavior for a given pixel for a specific fire simulation). Weather is by far the most dynamic variable as it changes frequently. Thus, each pixel may burn many times with different fire spread patterns based on the aforementioned factors. The fire intensity scale maps represent an average fire intensity map.

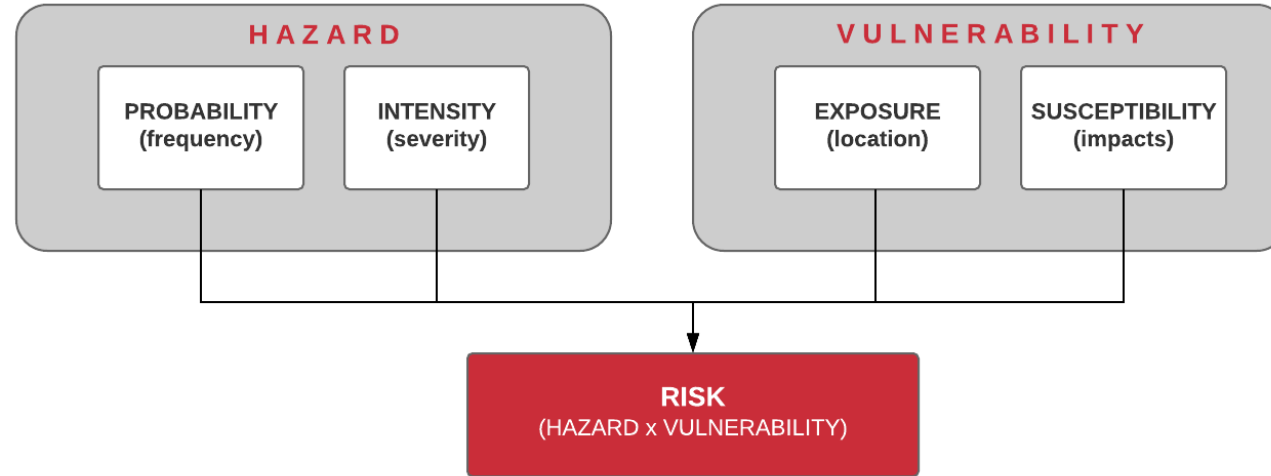
The fire intensity scale map is derived at a 20-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.



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Forest Atlas Fire Intensity



PROBABILITY = the likelihood of a fire burning at a specified place during a specified time

INTENSITY = the characteristics of a fire that causes effects should a fire occur

EXPOSURE = the location of resources & assets with respect to the wildfire hazard

SUSCEPTIBILITY = the relationship between fire behavior and outcomes (expected impacts from different intensity fires)

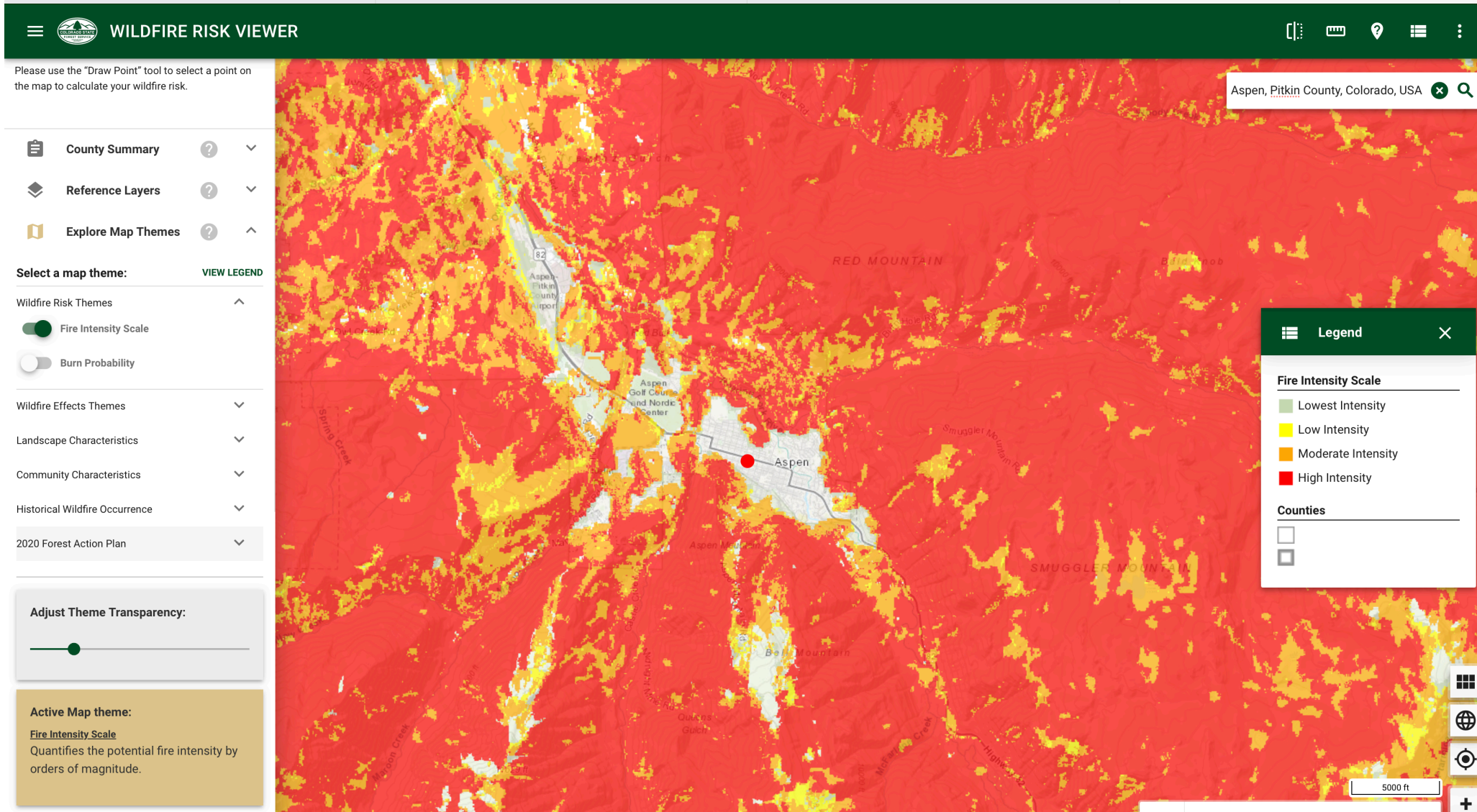


Adapted from Scott, Thomson, Calkin, 2013.



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WILDFIRE RISK VIEWER- FIRE INTENSITY SCALE



Lake Christine



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STRUCTURE: Codes and Standards

CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE
CHAPTER 7A – MATERIALS AND CONSTRUCTION
METHODS FOR EXTERIOR WILDFIRE EXPOSURE
 (Matrix Adoption Tables are nonregulatory, intended only as an aid to the code user.
 See Chapter 1 for state agency authority and building applications.)

| Adopting agency | CITY | | | | | | | | | | | | | | |
|---|------|--------|-----|---|---|---|---|---|---|---|---|---|----|----|--|
| | SAC | SSO-CO | SBM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| Adopt entire chapter | | | X | | | | | | | | | | | | |
| Adopt entire chapter as amended (amended sections listed below) | | | | | | | | | | | | | | | |
| Adopt only those sections that are listed below | | | | | | | | | | | | | | | |
| Chapter / Section | | | | | | | | | | | | | | | |

CHAPTER 7A [SFM]
MATERIALS AND CONSTRUCTION METHODS
FOR EXTERIOR WILDFIRE EXPOSURE

SECTION 701A
SCOPE, PURPOSE AND APPLICATION

701A.1 Scope. This chapter applies to building materials, systems and/or assemblies used in the exterior design and construction of new buildings located within a Wildland-Urban Interface Fire Area as defined in Section 702A.

701A.2 Purpose. The purpose of this chapter is to establish minimum standards for the protection of life and property by increasing the ability of a building located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area to resist the intrusion of flames or burning embers projected by a vegetation fire and contribute to a systematic reduction in configuration losses.

701A.3 Application. New buildings located in any Fire Hazard Severity Zone or any Wildland-Urban Interface Fire Area designated by the enforcing agency constructed after the application date shall comply with the provisions of this chapter.

Exceptions:

- Buildings of an accessory character classified as a Group U occupancy and not exceeding 120 square feet in floor area, when located at least 30 feet from an applicable building.
- Buildings of an accessory character classified as Group U occupancy of any size located least 50 feet from an applicable building.
- Buildings classified as a Group U Agricultural Buildings, as defined in Section 202 of this code (see also Appendix C – Group U Agricultural Buildings), when located at least 50 feet from an applicable building.

4. Additions to and remodels of buildings originally constructed prior to the applicable application date.

5. Group C special buildings conforming to the limitations specified in Section 430.4.1.

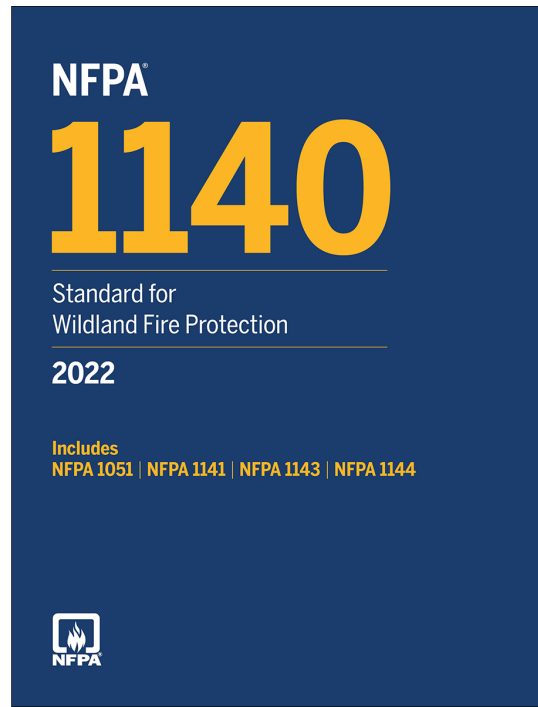
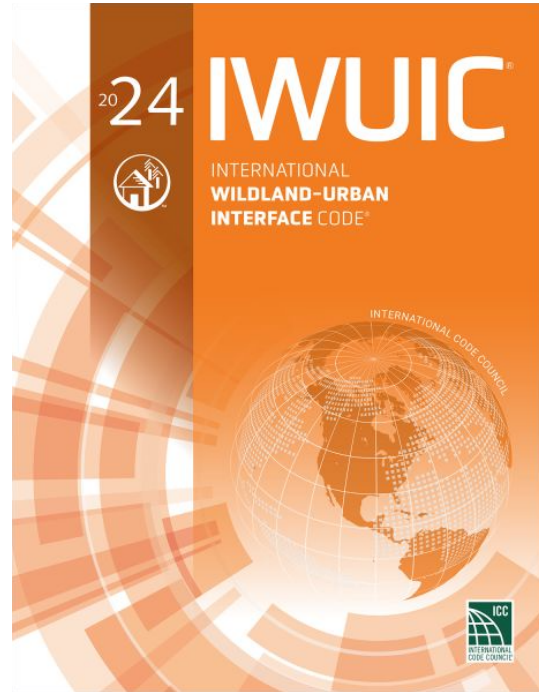
For the purposes of this section and Section 710A, applicable building includes all buildings that have residential, commercial, educational, institutional, or similar occupancy type use.

701A.3.1 Application date and where required. New buildings for which an application for a building permit is submitted on or after July 1, 2008 located in any Fire Hazard Severity Zone or Wildland-Urban Interface Fire Area shall comply with all sections of this chapter, including all of the following areas:

- All unincorporated lands designated by the State Board of Forestry and Fire Protection as State Responsibility Area (SRA) including:
 - Moderate Fire Hazard Severity Zones.
 - High Fire Hazard Severity Zones.
 - Very-High Fire Hazard Severity Zones.
- Land designated as Very-High Fire Hazard Severity Zone by cities and other local agencies.
- Land designated as Wildland-Urban Interface Fire Area by cities and other local agencies.

Exceptions:


- New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas, for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter.



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SITE: HIZ, SSD and HMM

FIRE-RESISTANT LANDSCAPING
A "how to" guide for protecting your home



- LANDSCAPING DEFENSIBLE SPACE
- NON-COMBUSTIBLE LANDSCAPE ZONE
- TYPES OF GROUND COVER
- STRUCTURAL ELEMENTS
- LANDSCAPE MAINTENANCE
- PROPERTY SELF ASSESSMENT



TOWN OF VAIL

LOW-FLAMMABILITY LANDSCAPE PLANTS
Fact Sheet 6.3051 Wildfire Mitigation Series, Landscaping and Planting
By S. Carter, N. Goeckner, C. Julian (CSFS), L. Langelo, I. Shonie and C. Dennis (Emeritus CSFS) (4/23)





Introduction

In Colorado, in the wildland-urban interface (WUI), it isn't a matter of if a wildfire will impact residences and properties, but when. The WUI includes any areas where structures and other human developments meet or intermingle with wildland vegetative fuels, including grasses, shrubs and trees. Wildfires are a natural part of Colorado's varied ecosystems. Planning ahead and taking action to reduce the risk of wildfires can increase the likelihood a home survives when wildfires do occur. Firefighters do their best to protect residents, but ultimately, it's your responsibility to protect your property and investments from wildfire.

This fact sheet is a part of a series of three publications created to help homeowners focus on actions that are effective in reducing wildfire hazards on properties. These efforts should always begin with the home or structure itself and progress outward. Defensible space is the area around a home or other structures that has been modified to reduce fire hazards by creating space between potential fuel sources.

Quick Facts

- The right plants around structures are important for wildfire safety.
- Management of defensible space and plant types is essential.
- This fact sheet is one of a series of three.
- Plants rated 10 have the least flammability.
- This fact sheet recommends low-flammability plants for zones 1 and 2.
- Refer to the Colorado State Forest Service's Home Ignition Zone guide for further details on home ignition zones.

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C. Dennis - Emeritus CSFS
04/2023
extension.colostate.edu

Low-Flammability Landscape Plants

Fact Sheet 6.3051 Wildfire Mitigation Series, Landscaping and Planting

Introduction

In the defensible space, natural and man-made fuels are treated, removed or reduced to slow the spread of wildfire and alter fire behavior. Plants that are low flammability are selected for planting, especially closer to the home.

Creating an effective defensible space involves establishing a series of management zones. Develop these zones around each building, including detached garages, storage buildings, barns and other structures. Recognize that fuel continuity and density play a critical role in wildfire behavior. Zones are defined from the structure edge in feet:

- Zone 1: 0-5 feet**
- Zone 2: 5-30 feet**
- Zone 3: 30-100 feet**

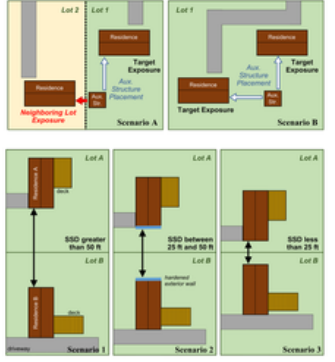
This fact sheet covers plants in zones 1 and 2; a different publication, the Fire-Resistant Landscaping fact sheet, discusses plants in zone 3. For a defensible space plan for properties, contact the nearest Colorado State Forest Service field office or local CSU Extension office for guidance. Consult with a forester, fire department staff or community organization appropriately trained in wildfire mitigation practices.



Illustration: Bonnie Palmatroy, Colorado State University

NIST Technical Note 2205

WUI Structure/Parcel/Community Fire Hazard Mitigation Methodology




Alexander Maranghides
Eric D. Link
Steven Hawks
Jim McDougald
Stephen L. Quarles
Daniel J. Gorham
Shonali Nazare


This publication is available free of charge from:
<https://doi.org/10.6028/NIST.TN.2205>

NIST
National Institute of Standards and Technology
U.S. Department of Commerce


THE HOME IGNITION ZONE



A guide to preparing your home for wildfire and creating defensible space



Formerly Quick Guide 7502 (2012), Protecting Your Home From Wildfire




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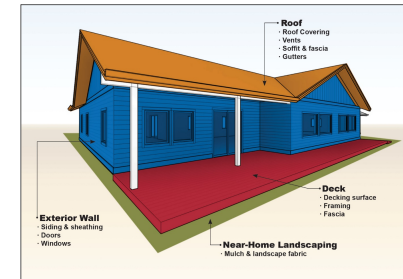
Cost and Insurability



A Research Paper by



Building a Wildfire-Resistant Home: Codes and Costs



November 2018



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PRECEDENT AND DRIVERS

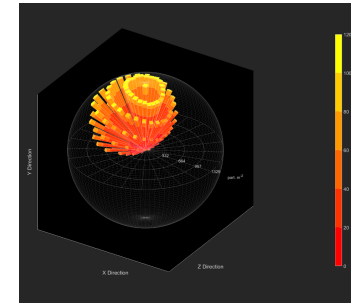
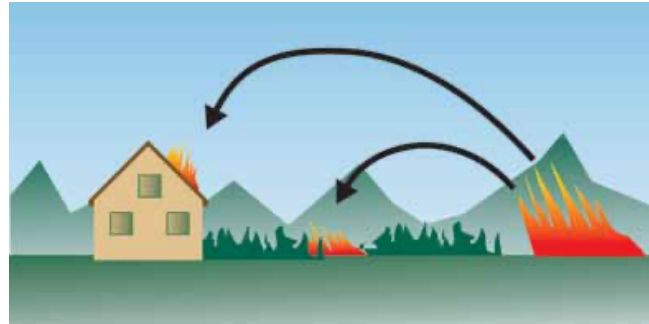


**LIVE
WILDFIRE
READY**



What are we trying to defend against? Three modes of heat transfer

**Ember
Fire brands, transported by
convective lifting, create spot fires;
Firebrand rose**



**Direct flame impingement
(direct contact)**



**Radiant heat
(follows inverse square rule)**



Credit: CSFS, NIST



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BUILDING DESIGN- STRUCTURE HARDENING

| | <u>IRC/IBC</u> | <u>IBHS</u> | <u>IWUIC</u> |
|---|----------------|-------------|--------------|
| <i>Roof Covering Class A Rating</i> | | | |
| <i>or Roof Assembly</i> | | | |
| <i>Roof Valleys</i> | | | |
| <i>Vents</i> | | | |
| <i>Gutters and Downspouts</i> | | | |
| Protection of Eaves | | | |
| Exterior Doors | | | |
| Underfloor Enclosures | | | |
| Appendages and Projections | | | |
| Exterior Glazing | | | |
| Trim, shutters | | | |
| >=1-hour fire-resistance construction | | | |
| Approved noncombustible materials. | | | |
| Heavy timber or log wall construction. | | | |
| Fire-retardant-treated wood exterior side | | | |
| Ignition-resistant materials. | | | |
| Flashing: a minimum of 6" of metal flashing | | | |



Exceeds requirements



Meets requirements

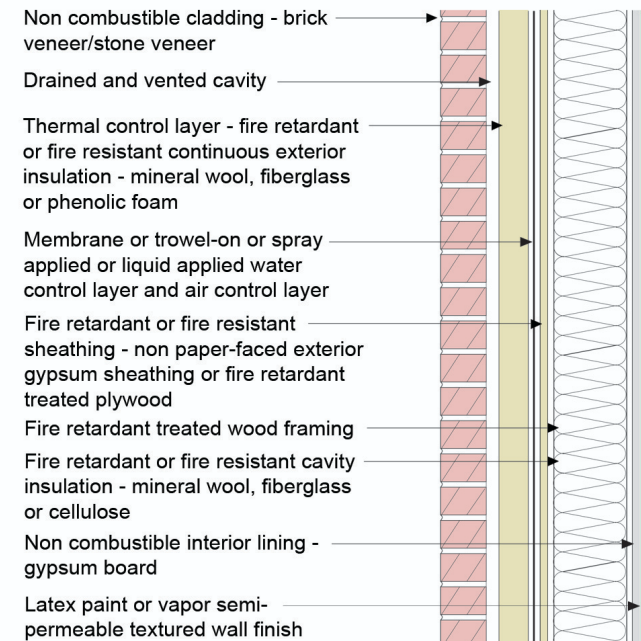
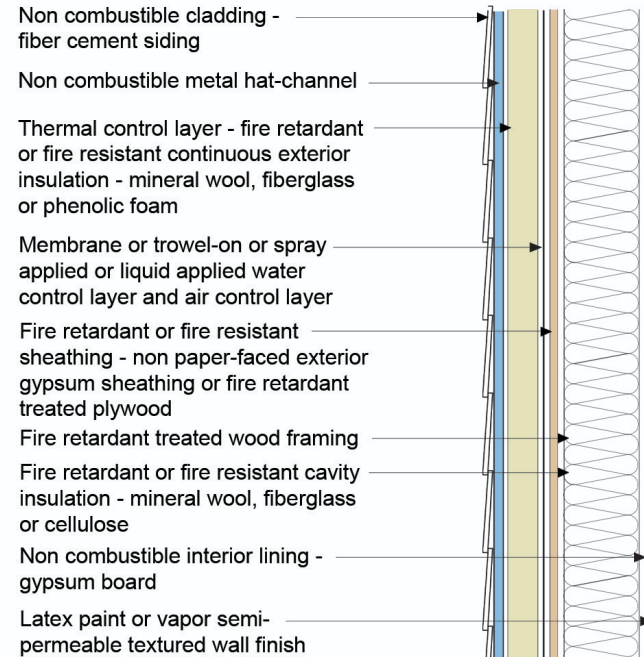
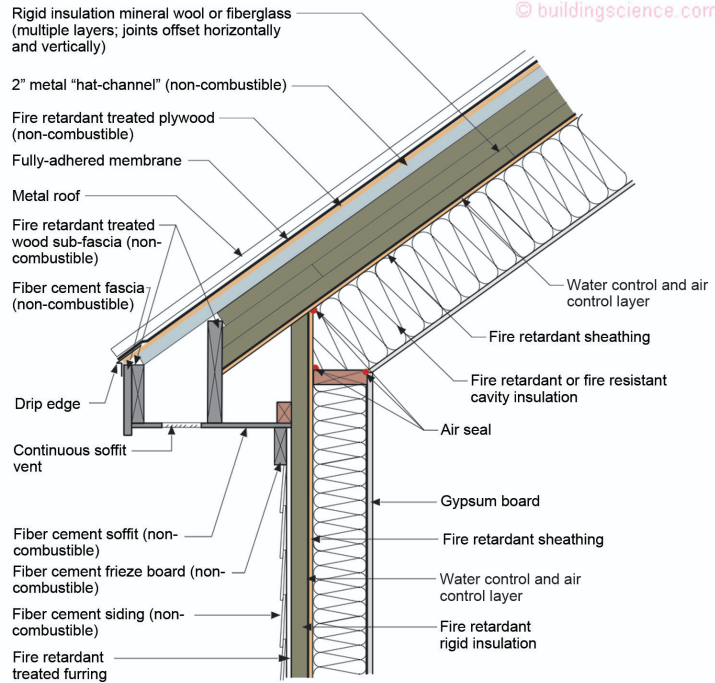


Less than requirements



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BUILDING DESIGN- STRUCTURE HARDENING



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SITE DESIGN- FUEL MODIFICATION

Fire Hazard Severity /Reduction and concept of zones
(House and immediately surrounding)



Credit: CSFS



SESSION SUMMARY AND LESSONS

History of Fire In Colorado

History of WUI Code in Colorado

Input and process for adoption of a statewide code

Research and precedent in forming a Colorado Code

Where does the code apply- Mapping

How does the code apply to structure design

How does the code apply to site and area design



QUESTIONS

Do you have questions or suggestions for the Colorado Division of Fire Prevention and Control and the Colorado Wildfire Resiliency Code Board?

Please email us at cdps_dfpc_wrcb@state.co.us

