# Planning for Growth and Open Space Conservation

This webinar series is sponsored by:
USDA Forest Service
State and Private Forestry - Cooperative Forestry

Organized by
Rick Pringle, Susan Stein, Sara Comas, Susan Guynn (Clemson University)
and the
Forest Service National Open Space Conservation Group

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**Audio is Streamed Through the Computer**

# Learn About the Series

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<u>Listen to our past webinars:</u>

▸ <u>Session #9:</u> Private land conservation programs from the Farm Bill: Natural Resources Conservation Service, Farm Service Agency, and US Forest Service.

▸ <u>Session #8:</u> Landscape Conservation Initiatives: US Fish and Wildlife Service, Bureau of Land Management, Department of Defense, Natural Resources Conservation Service

▸ <u>Session #7:</u> Science to inform Open Space Conservation: Land use changes, forest fragmentation, and the Wildland-Urban Interface

▸ <u>Session #6:</u> Facilitating Large Landscape Conservation Efforts: Working effectively across boundaries in the Northeast and Crown of the Continent

▸ <u>Session #5:</u> Local and Regional Land Trusts: Essential partners and the tools they provide

▸ <u>Session #4:</u> The Forest Service Toolbox: Conservation easement and land acquisition programs

▸ <u>Session #3:</u> Green Infrastructure Planning: Connecting partners and greenspaces

▸ <u>Session #2:</u> YES YOU CAN! Participating in Growth Planning Beyond the Green Line

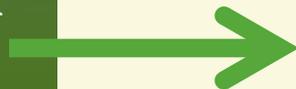▸ <u>Session #1:</u> National Forest Management in the Face of Housing Growth

<u>Future Topics:</u>

Please <u>register</u> in advance if you would like to attend these presentations.

▸ <u>Session #11:</u> An All Lands Approach to Ecosystem Services for Water

**Please submit your feedback <u>here</u>**

# Learn About the Series

**Click on the session titles for more info on recordings, slide presentations, and featured resources**

# Webinar Resources and Tools



Find relevant resources for each webinar session here!
If you have relevant resources to share please send them to us!

# Session #20 – Planning for Urban Forests

## Wednesday, January 22 at 2:00 – 3:30 pm Eastern

**Jim Schwab**

American Planning Association, Hazards Planning Research Center

**C.J. Lammers**

Maryland-National Capital Park and Planning Commission, Environmental Planning Section

*Nancy Humenik-Sappington*

Consulting Arborist/Landscape Designer

# Logistics – Q&A

- **Continuing Education Credits**
  - Attend entire presentation

- **Questions for speakers – chat pod**

- **Technical difficulties – chat pod or email Susan Guynn:  SGUYNN@clemson.edu**

# Getting to Know You!

**Sarah McCaffrey**
**USFS Northern Research Station**

# Understanding Homeowners and Wildfire



**Sarah McCaffrey,** Research Social Scientist

**USDA Forest Service, Northern Research Station**

**847-866-9311 ex 20; smccaffrey@fs.fed.us**

*McCaffrey–Planning for Growth Webinar- Nov 6, 2013*

# What have we learned so far?

- Since 1998 substantial research on pre-fire social dynamics including:

  - Fuels mitigation on public lands
  - Mitigation on private land (e.g. defensible space)

- Increasing research on during and post-fire social dynamics *(Communication, Alternatives to evacuation, Evacuation decision making, etc.)*

Also substantial research on how to change behavior and/or social norms
*(Social Marketing, Natural Hazards, Env Ed)*

# Changing Behavior/Norms?
## Understand your audience

- **Deal with misconceptions**
  - Avoid preconceived notions

- **Multiple audiences - Tailor info for them**
  - Avoid saying what audience already knows
  - Relate to what audience cares about and is interested in

- **Identify resource limitations**

# Overall, research findings <u>do not </u>support many of the Conventional Wisdoms about public response to fire management.

# *False Conventional Wisdom #1 –*
## Individuals don't understand the high fire risk

### Reality - Most recognize the risk

- Risk is a complex and subjective concept – both in terms of assessment and response.

- Higher risk perception does not necessarily lead to action.  It is a necessary but not sufficient condition

- **Actual decision to mitigate will also depend on other factors**
  - risk tolerance
  - trade-offs with benefits (nature, privacy, etc.)
  - individual capacity

# *False Conventional Wisdom #2*

## "Smokey has taught the public to think all fire is bad"

### Reality

1. Consistent evidence of understanding (often quite sophisticated) of fire ecology, including beneficial role of fire.

2. 80% see prescribed fire and thinning as an appropriate management tool

   - Roughly 30% give strong approval and another 50% give qualified approval

## *Clear preference for active management*

# *False Conventional Wisdom #3 –* People don't take responsibility

## Reality - Strong sense of *shared responsibility*

- **People recognize their responsibilities** – expect to reduce risk on own property

  - *Recognize that risk is shared – concerned about actions on adjacent properties*

- **Expectations of government agencies** (local, fed, etc.)

  - That they take care of their land

  - Education: Help understanding risk (fire behavior) and specifics on how to mitigate

  - Maybe help with some larger scale obstacles (disposing of materials)

# False Demographic *Conventional Wisdoms*
## *No consistent evidence that:*

- *New residents* are less aware and/or active in relation to fire mitigation

- *Part-time residents* are less likely to understand fire risk than full-time residents *(main issue appears to be time)*

- *Experience* with fire will have a consistent effect

- *Basic demographic* characteristics (gender, income, education, etc.) have a meaningful effect.

# Fire/Fuels Management Public Acceptance Model
## (Thinning, Prescribed Fire, WFU)

**Trust**
Credibility
Competence

**Communication Process Interactivity** Transparency

**Level of Fire risk**

**Acceptance** of Fire/Fuels Management

**Concerns**
Prescribed fire (escape, smoke)
Aesthetics, other values (+, -)
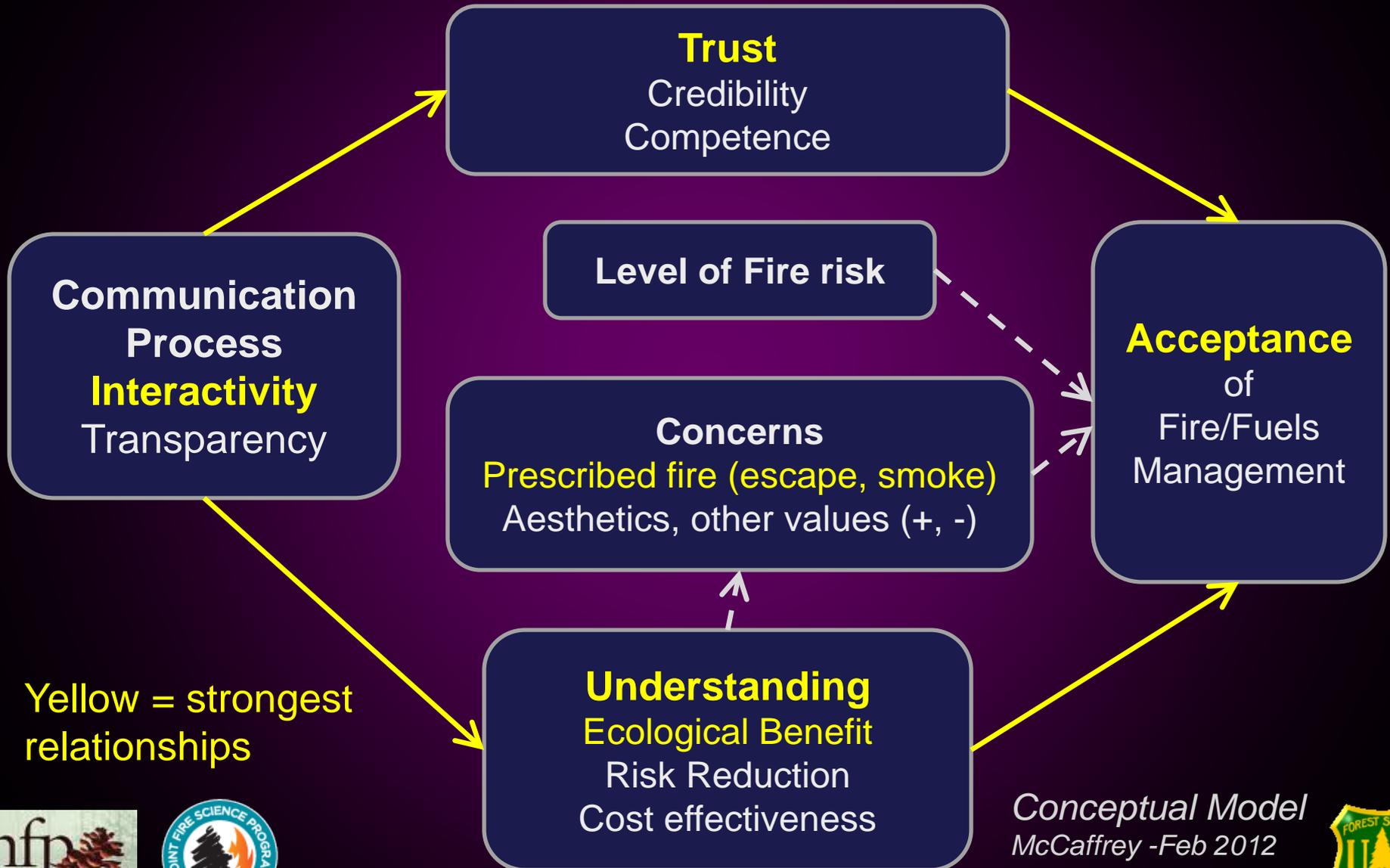
Yellow = strongest relationships

**Understanding**
Ecological Benefit
Risk Reduction
Cost effectiveness

*Conceptual Model*
*McCaffrey -Feb 2012*

*McCaffrey–Planning for Growth Webinar- Nov 6, 2013*

# To what extent have you <u>managed your vegetation</u> to prepare for a wildfire? *(McCaffrey & Winter Study)*

| | Ventura | Alachua | Helena/Tri-County | Total |
|---|---|---|---|---|
| <u>A great deal</u> | <u>77</u> | 38 | 5 | 58 |
| Somewhat | 21 | | | 31 |
| Little or None | 2 | 24 | 9 | 11 |

Most studies show similar numbers for veg mgmt
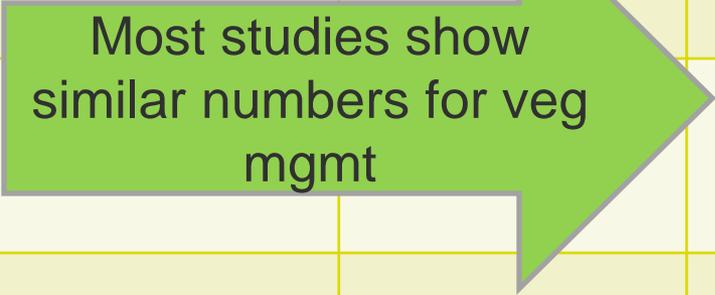
*Significant difference between locations*

# To what extent have you made your house more fire resistant?

| | Ventura | Alachua | Helena/Tri-County | Total |
|---|---|---|---|---|
| A great deal | 48 | 26 | 38 | 38 |
| Somewhat | 37 | 35 | 40 | 38 |
| Little or None | 15 | 39 | 22 | 24 |

*Significant difference between locations*

# Recognize the Risk → Consider Taking Action → Take Action

## Information About Risk

## Factors that Lead to Consideration of Taking Action

- Understanding of Possible Risk Mitigation Actions

- Level of Fire Risk
- Risk Tolerance/Aversion (+, -)
- Experience (+, -)
- Social Norms (+, -)

## Trade-off Analysis

- Resource Limitations (Cost, Time, Physical Ability)
  - Vegetation Disposal
  - Perceived Effectiveness
  - Competing Values (+, -) (laws, aesthetics, etc. )
- Complimentary Values (+, -) (aesthetics, wind, etc.)
- Adjacent propty actions (+,-)
  - Social Norms (+, -)

## Decision to Act

## Trust in information source
Credibility
Competence

## Info Dissemination
Interactive

## DEFENSIBLE SPACE
*Conceptual Model - McCaffrey – Feb 2012*

*McCaffrey–Planning for Growth Webinar- Nov 6, 2013*

# Synthesis of Communication Research

Social Science to Improve Fuels Management: A Synthesis of Research Relevant to Communicating with Homeowners About Fuels Management

Wildland Fire Behavior & Forest Structure
Environmental Consequences
Economics
Social Concerns
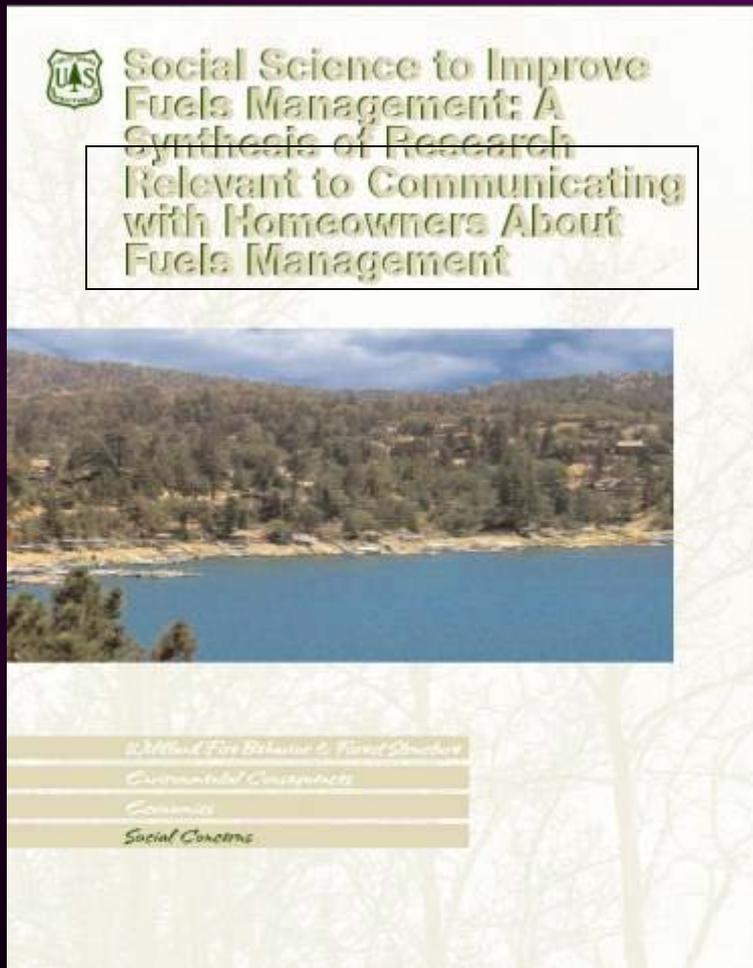
Effective communication for fostering changes in behavior and social norms

Findings from fields of:

- Natural Hazards

- Social Marketing

- Environmental Education

*GTR-NC-267*

# Recent Syntheses of Social Science Research



**USDA**
United States Department of Agriculture
Forest Service
Northern Research Station
General Technical Report NRS-111

Social Science at the Wildland-Urban Interface: a Compendium of Research Results to Create Fire-Adapted Communities

Eric Toman
Melanie Stidham
Sarah McCaffrey
Bruce Shindler

**USDA**
United States Department of Agriculture
Forest Service
Northern Research Station
General Technical Report NRS-104

Research Perspectives on the Public and Fire Management: A Synthesis of Current Social Science on Eight Essential Questions

Sarah M. McCaffrey and Christine S. Olsen

84 articles on homeowner mitigation
83 articles on public acceptance of fuels treatments on public lands

*GTR-NRS-111*
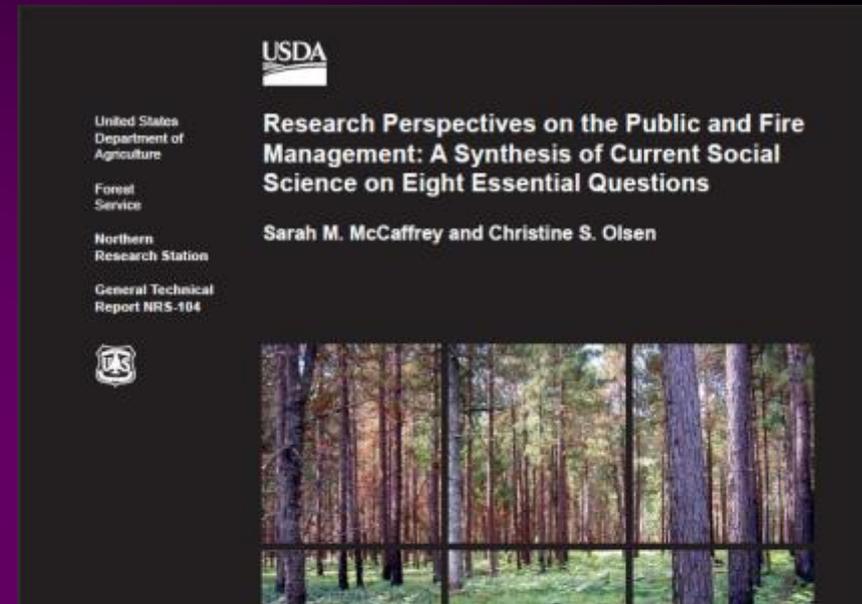
Over 60 studies

*Surveys, focus groups, interviews*

*GTR-NRS-104*

**http://www.treesearch.fs.fed.us/**

**Carol Rice**

**Wildland Resources Management Inc.**

# Planning to Live with Fire
## Designing and Retrofitting Communities with Fire in Mind

### - Community Wildfire Protection Planning -

*Carol L. Rice*
*Wildland Resource Management*
*November 6, 2013*

**Planning for Growth and Open Space Conservation**

# The Role of the Community/Fire Planner

## YOU can Prevent Wildfire Damage!

- Hazard Assessment
- Land Use Planning
- Community Design
- Conditions of Approval
  - Fire Protection Plans
  - Fuel Management
  - Biotic Protection
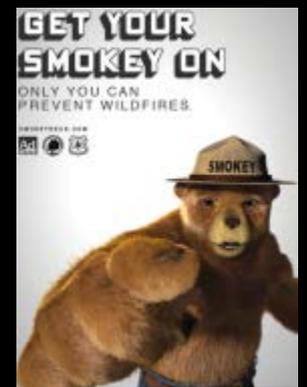
# Types of Community Planning and Fire Plans



- General/Master Plans
- Specific Plans
- Fire Protection Plans
- County fire plans
- Regional fire plans
- Hazard Mitigation Plans
- CWPPs Community Wildfire Protection Plan

Yellow = Local Plans (future), Red = Operational, Green = Existing Communities

**All most effective with new construction  - Except CWPP**

# Tools for Planners

**There are fewer solutions for existing developments**

Taken from: Managing Fire in the Urban-Wildland Interface

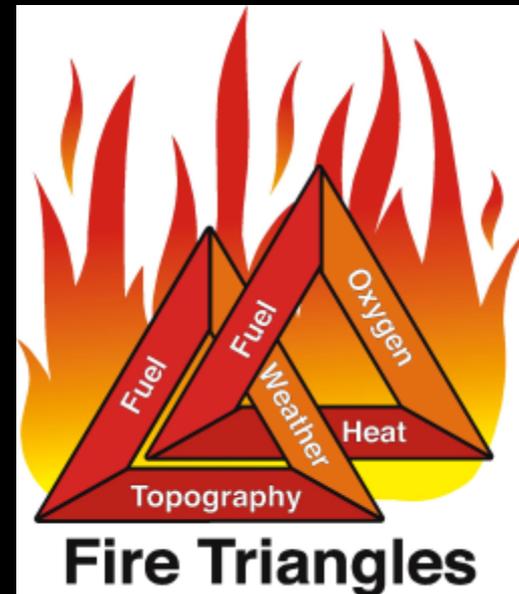| Practical Solutions and Management Approaches - Best Practices | General Plan | Safety Element or Pre-Disaster Mitigation Plan | Zoning | Specific Plan | CEQA | Design Guidelines | Development | Consutrction | Master Plan or Management Plan | Emergency Response Plan | Community Awareness Campaign | Code Enforcement | Changes to the Existing Physical Environment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tools for Carrying out Best Practice** | *Tools Used for Preplanning for New Development or Land Management* | | | | | | | | *Tools Used to Mitigate Existing Conditions* | | | | |
| **Ignition Prevention & Community Awareness Programs** | | | | | | | | | | | | | |
| Envineering | | ✔ | ✔ | | ✔ | ✔ | | | | | | | |
| Education | | ✔ | ✔ | | ✔ | ✔ | | | | ✔ | ✔ | | ✔ |
| Enforcement | | ✔ | ✔ | | | | | | | | | ✔ | |
| **Development of Policy and Land Use Plans** | | | | | | | | | | | | | |
| Land Use Designation and Zoning Ordinances | ✔ | | ✔ | | | | | | | | | | |
| Project Planning and Review Processes | | | | ✔ | ✔ | ✔ | ✔ | ✔ | | | | | |
| Guidelines, Standards, Codes and Local Ordinances | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ | |
| General Plan and Safety Element | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | | |
| Specific Plan | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | | | | | |
| Subdivision Ordinance | ✔ | | ✔ | | | | ✔ | ✔ | | | | | |
| Development Agreements | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | | | | | |
| Land Use Plans and Master Plans | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | | | | | |
| **Community Design Practices** | | | | | | | | | | | | | |
| New Residential Layout | ✔ | | | ✔ | ✔ | ✔ | ✔ | ✔ | | | | | |
| Existing Residential Development | ✔ | ✔ | | | | | | ✔ | | ✔ | ✔ | ✔ | ✔ |
| Utility Locations & Capacity | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Road Networks for Access & Evacuation | ✔ | ✔ | | | | | | | | | | | |
| Structure Design & Materials | | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | | | | ✔ | ✔ |
| Domestic Landscape Fuels | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ |
| Wildland Fuels | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | | ✔ | ✔ | ✔ |
| **Emergency Services & Residents Response to Fire** | | | | | | | | | | | | | |
| Emergency Response | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | |
| Residents Response | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | |

# Elements of Fire to Address Through Planning

- Topography
- Fire Weather
- Fuel
  - Structure
  - Vegetation
- Utilities
- Fire Response & Recovery



Fire Triangles

# Scale and Element of Tools

| ELEMENTS THAT CONTRIBUTE TO POTENTIAL DAMAGE FROM FIRE | | TOOLS AVAILABLE TO THE VARIOUS PLAYERS | | | | | |
|---|---|---|---|---|---|---|---|
| | | Individual | Neighborhood Groups | Local Govt | Regional | State | National |
| | Topography | A | A | A | A | A | A |
| | Severe fire weather/fire history | A | A | A | A | A | A |
| ELEMENTS OF THREAT | Fuel | | | | | | |
| | Structure-related elements | | | | | | |
| | Structure density | NTA | NTA | CD, Po | NTA | NTA | NTA |
| | Structure construction, design, and materials | CD | CD | CD, Po | CD, Pc, Po | CD, Ps, Pc | Ps |
| | Structure setback | NTA | NTA | CD, Po | NTA | NTA | NTA |
| | Landscape/wildland vegetation-related items | | | | | | |
| | Domestic landscapes/ defensible space | CD | CD | CD, Po | Pc, Po | Ps, Pc | Ps |
| | Wildland vegetation | CD | CD | CD, Po | Pc, Po | Ps, Pc | Ps |

**Key to Tool Symbols**

A = Awareness Through Ignition Prevention Programs (chapter 10)
Land Use Policy and Planning (chapter 11)

CD = Mitigation Action through Community Design (chapters 12–18)
NTA = No tool available
Ps = Standard

Pc = Code
Po = Ordinance
R = Responses to Fire (chapter 19)
NTA = No tool available

# Scale and Element of Tools (2)

| ELEMENTS THAT CONTRIBUTE TO POTENTIAL DAMAGE FROM FIRE | TOOLS AVAILABLE TO THE VARIOUS PLAYERS | | | | | |
|---|---|---|---|---|---|---|
| | Individual | Neighborhood Groups | Local Govt. | Regional | State | National |
| **Utilities and infrastructure** | | | | | | |
| Water supply for suppression services | Augment | Augment | Po | Local utility company | Ps, Pc | Ps |
| Utility locations (gas/electric/propane) | NTA | Local utility company | Po | Pc, Po | Ps, Pc | Ps |
| **Community fire protection** | | | | | | |
| Emergency access (fire suppression and evacuation) | R | R | Po, R | Pc, Po, R | Ps, Pc, R | Ps, R |
| Level of suppression service | Augment | Augment | Po | NTA | NTA | NTA |
| Community involvement and education | A | A | A | A | NTA | NTA |

*(Row label on left axis: ELEMENTS THAT AFFECT THE ABILITY TO SUPPRESS FIRE)*

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From AEP article Miller et al

## Reduced Role of Planners in Helping Suppress Fires

# Scale and Element of Tools

| ELEMENTS THAT CONTRIBUTE TO POTENTIAL DAMAGE FROM FIRE | TOOLS AVAILABLE TO THE VARIOUS PLAYERS | | | | | |
|---|---|---|---|---|---|---|
| | Individual | Neighborhood Groups | Local Govt. | Regional | State | National |
| Topography | A | A | A | A | A | A |
| Severe fire weather/fire history | A | A | A | A | A | A |
| Fuel | | | | | | |
| Structure-related elements | | | | | | |
| Structure density | NTA | NTA | CD, Po | NTA | NTA | NTA |
| Structure construction, design, and materials | CD | CD | CD, Po | CD, Pc, Po | CD, Ps, Pc | Ps |
| Structure setback | NTA | NTA | CD, Po | NTA | NTA | NTA |
| Landscape/wildland vegetation-related items | | | | | | |
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| | Emergency access (fire suppression and evacuation) | R | R | Po, R | Pc, Po, R | Ps, Pc, R | Ps, R |
| | Level of suppression service | Augment | Augment | Po | NTA | NTA | NTA |
| | Community involvement and education | A | A | A | A | NTA | NTA |

*Row label (vertical): ELEMENTS THAT AFFECT THE ABILITY TO SUPPRESS FIRE*

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From AEP article Miller et al

# Planning Processes & Practices

- Gather facts
- Create a vision
- Gather agreement

# Consistency is Required

**Assessment**

**Policy**

**Projects**

# Examples of Policy Goals

**Vision /Desired Outcome**

- Minimize the Number of Ignitions
- Install/maintain Defensible Space (Reduce Fire Intensity Next to Structures)
- Safe Access and Egress
- Limit Fire Size
- Promote Ecosystem Health
- Work Cooperatively on Projects
- Develop/update Wildfire Plan

# Best Practices

- **General/Master Plan**

- **Lot Layout**

- **Access**

- **Infrastructure**

- **Existing Developments**

Taken from:
Managing Fire in
the Urban-
Wildland Interface



http://solano.com/processxml.asp?tid=FM&StyleSheet=title.xsl
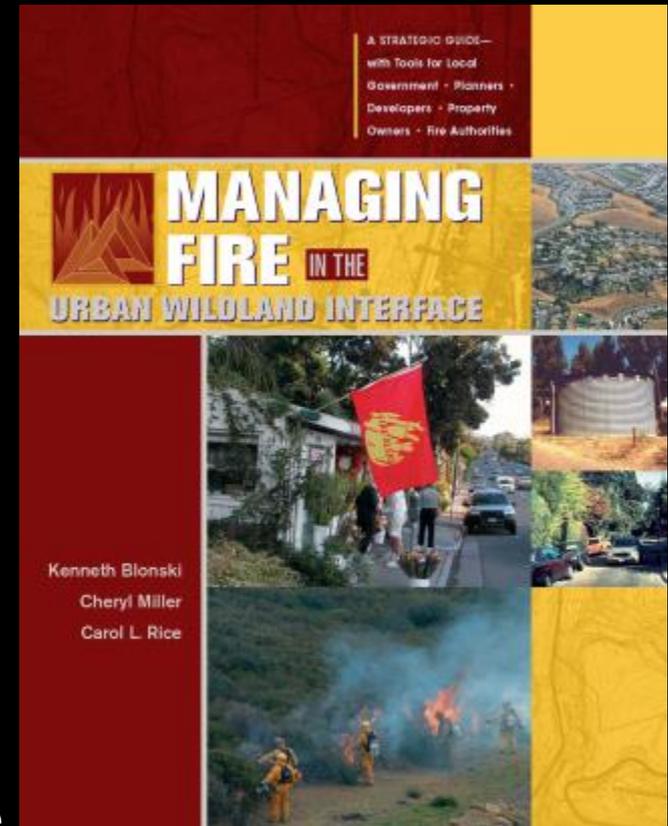
# Best Practices: General Plan

- Have a good hazard/risk assessment
- Use Safety Element to promote fire safety
- AND use Housing Element, Safety Element, Open Space Element, Circulation Element, Conservation Element to promote fire safety
- Identify issue of concern, policy and implementation measure

# Best Practices: Lot Layout



- **Avoid ridgetops**
- **Place structures away from slope edge**
- **Avoid structures at top of steep ravine**
- **Cluster lots** (not too close)
- **Have a break every 1000 ft between lots for access to open space**



D = 9'

D = 4.5'

H = 30'

H = 15'

Slope = H / D
D = Slope x H

H ◁ Slope

D

Fig 12-1
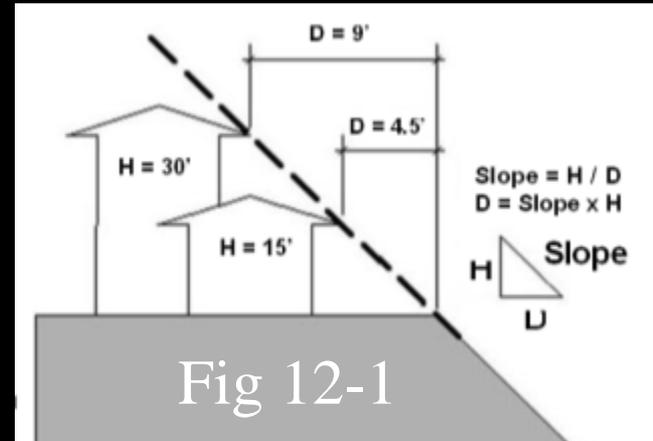
# Best Practices: Roads

- Design roads for simultaneous access and evacuation
    - Radii
    - Width
    - Grade
    - Surface
- Use roads as firebreaks
- Two access points – far apart
- Gates
- Signs
- EVAs

# Best Practices: Infrastructure



- **Water**
  - Power or gravity
  - Shutoffs
  - Connections
- **LG Tanks**
- **Electricity**
  - Backup
  - Backup

# Best Practices: Existing Development

- Reduce fuels in yards and in open space
- Improve access (parking, turnouts, veg)
- Designate shelter in place
- Enhance water supply
- Change structure exteriors
  - Roofs
  - Vents
  - Decks
  - Siding

Develop a Community Wildfire Protection Plan!

# Community Wildfire Protection Plans

- Addresses existing communities:
  - 4 environments: natural, built, response and social
- Many guides available (Society of American Foresters, ForEverGreen Forestry), California Fire Alliance
- Consider 4 phases of wildfire:
  - Prevention, Preparedness, Response & Recovery
- Highlights:
  - Gathers affected residents
  - Establishes plan of work
  - Sets priorities
  - Requires monitoring



TAKING ACTION
PREPARING FOR WILDFIRE IN THE SIERRA NEVADA

A landowner guide for balancing fire safety and conservation values.
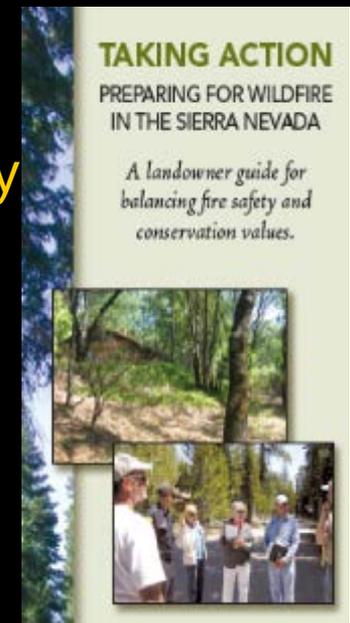
# Project Design and Review Process (Fire Focused)

- Planners and fire department meet early in process
- Include fire protection plan in Project Description
- Incorporate fire protection issues into infrastructure and lot layout
- Consider fire ecology and maintenance to improve:
  - Lot layout
  - Landscaping
  - Access (within open space)
- Meet with Project Proponent and their biologists
  - Consider cost & feasibility of maintenance of vegetation
  - Address native habitat & weeds in yards & common areas
  - Landscaping

# What you do matters!



- As effective as fire department in determining damage
- Lasting impact
- Affects more than structures and nearby environment



**"Where you live changes you"**

**- Frank Lloyd Wright**

As a planner, you are directing that change

# Thank You!

**Molly Mowery**
**Wildfire Planning International**

# FIRE ADAPTED COMMUNITIES

*Planning for Growth and Open Space Conservation Webinar Series*

November 6, 2013

Molly Mowery, President and Owner
Wildfire Planning International

# Fire adapted communities



Image source: www.fireadapted.org

# The fire adapted community toolkit

**Codes & ordinances**

**Exterior Fuel buffer**

**Ready Set Go! program**

**Prevention Education**

**Internal Safety Zones**

**Local capacity**

**Forest Management**

**Community Wildfire Protection Plan**

**Fuel reduction**

**Firewise Communities program**

**Cooperative fire agreements**
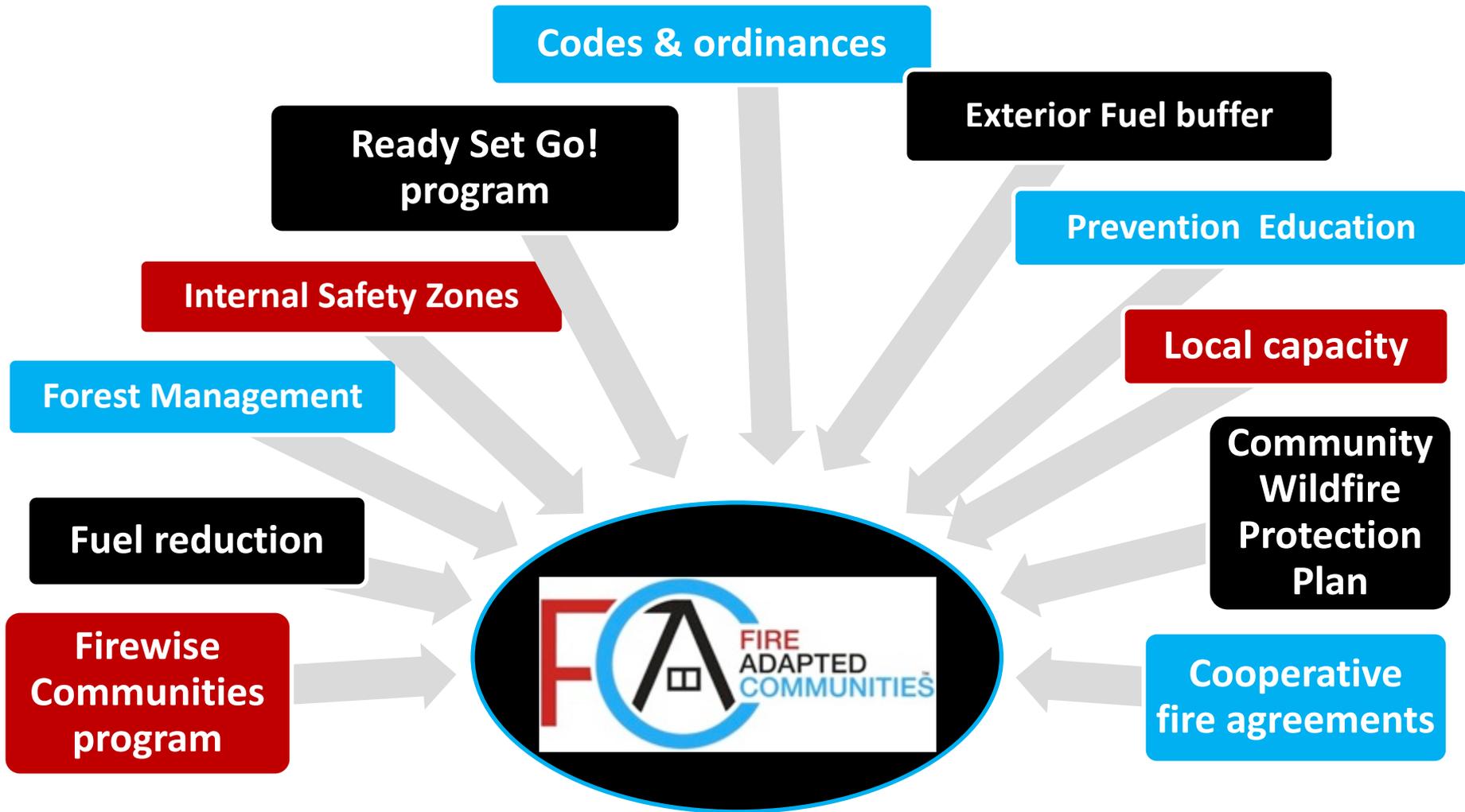
# Community wildfire protection plans

## Typical Objectives:

- Perform wildfire risk assessment
- Identify fuels reduction projects
- Address and reduce structural ignitability
- Identify local capacity building and training needs
- Promote wildfire awareness





Photo credits: Chaffee County (top), Inciweb.org (gscott);

# Ingress and egress
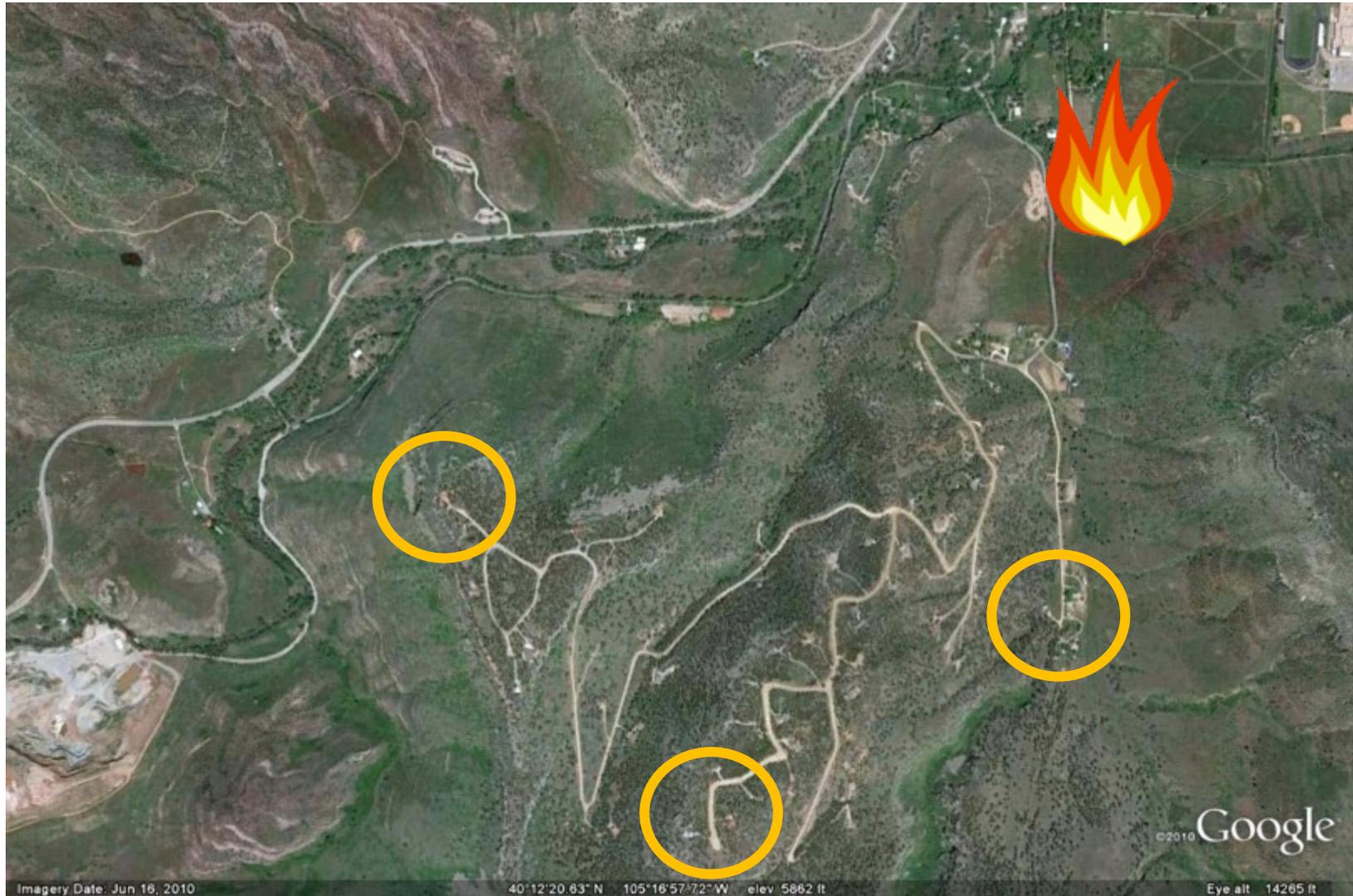
# Site layout, natural features



Photo credit: South Carolina Division of Forestry

# Structural vulnerability

# Mapping risk



Image source: http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_maps.php
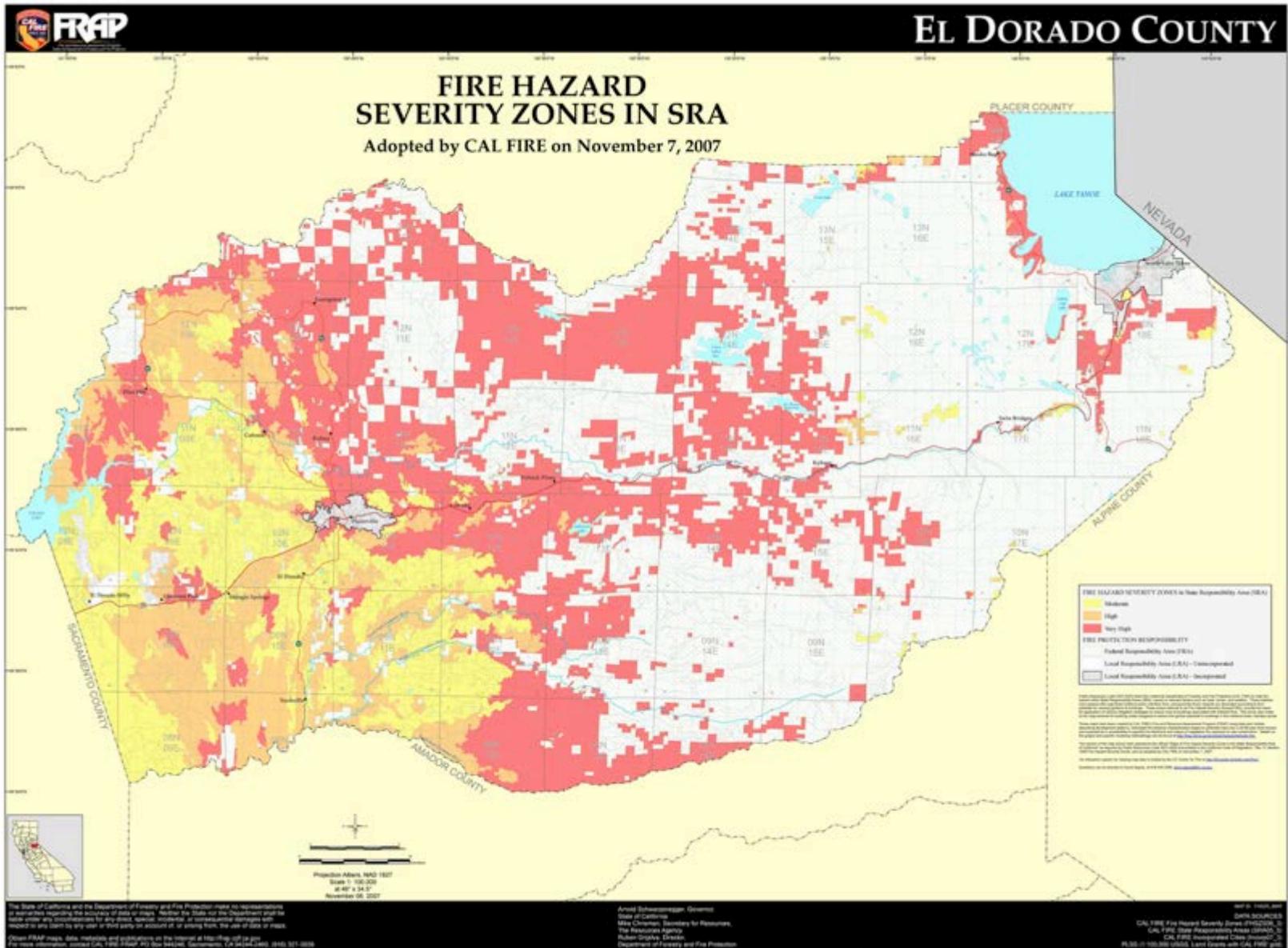
# Mapping risk
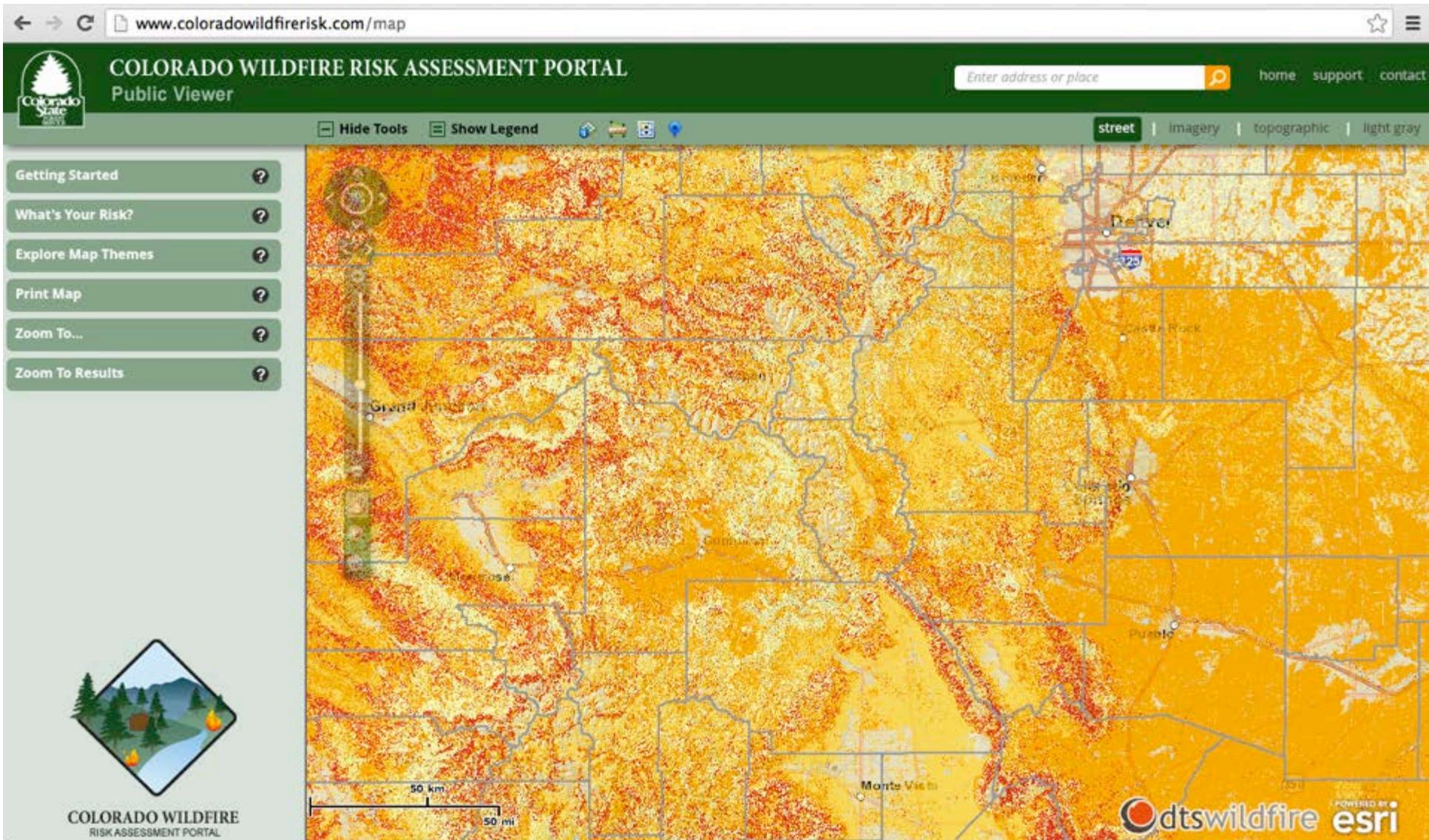
# Community wildfire protection plan working group



Photo credits:  inciweb.org (gscott), fema.gov

# Community wildfire protection plan resources



http://texasforestservice.tamu.edu/

# Firewise Communities/USA®



Photo credits: Sierra Forest Legacy Firewise Communities (left); New York State Department of Environmental Conservation (top right); Arizona State Forestry Division (bottom right)

# Firewise - resources



- www.firewise.org
- State Firewise programs

Image source: Kentucky Department of Forestry (left), Idaho Firewise

# Codes & regulations

Codes can address WUI hazard through regulation of:

- Land development & siting
- Vegetation & landscaping
- Building materials
- Attachments
- Access
- Water supply

# Codes & regulations - examples

- NFPA 1141: Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas

- NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire

- International Code Council: International Wildland Urban Interface Code
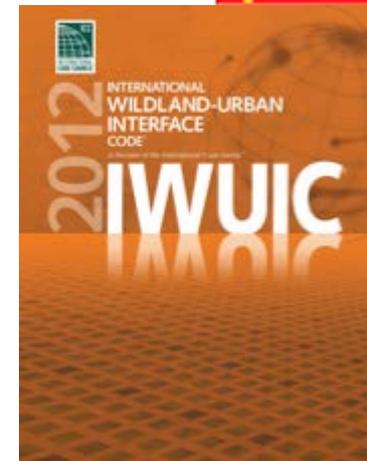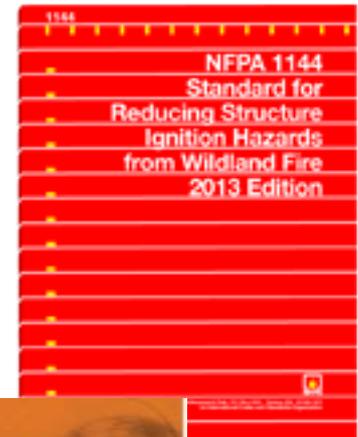
# Colorado Springs WUI regulations

- 1993 first wildfire-related ordinance
- 2003 citywide roof ordinance (bans wood shake roof in any replacement or repairs)
- Restrictions on hillside development
- Code also addresses:
  - Fire-resistant materials: walls, doors, windows, vents
  - Attachments: gutters, decks
  - Fuels management around structures

# Example: Waldo Canyon Fire



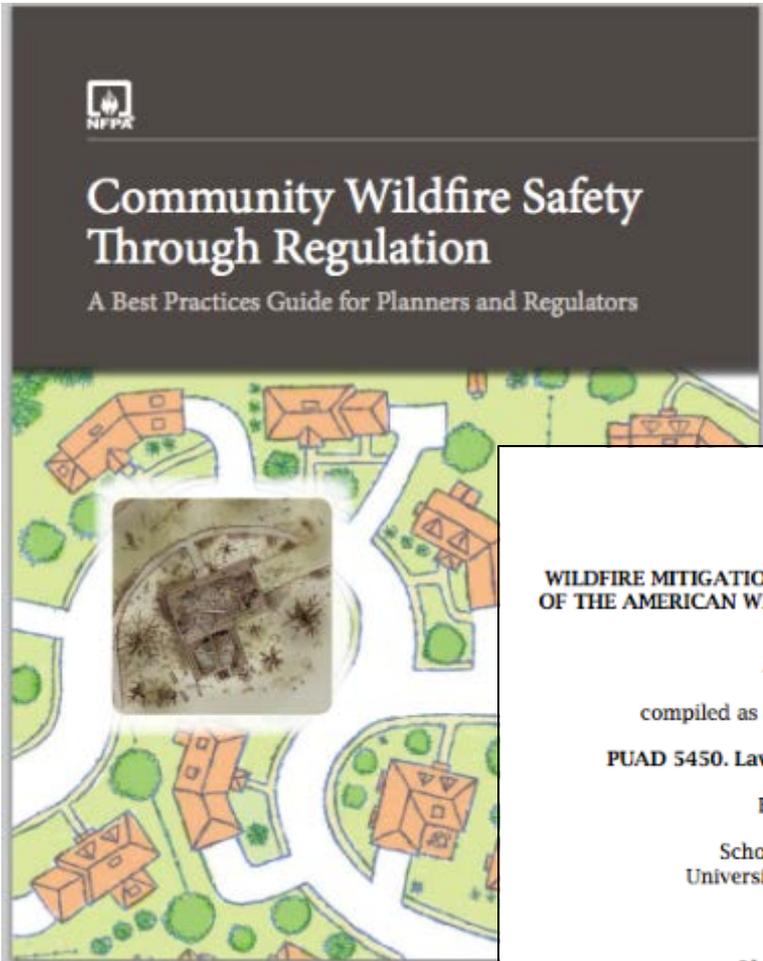Photo credits:  Colorado Springs Fire Department

Photo source: Colorado Springs Fire Department

# Codes & regulations - resources



**Community Wildfire Safety Through Regulation**
A Best Practices Guide for Planners and Regulators

- http://www.nfpa.org/~/media/Files/Wild land/WildfireBestPracticesGuide.pdf

- http://www.ucdenver.edu/academics/col leges/SPA/Research/EAWG/Research/wil dfires/Documents/WhtPprIntrstStdy15jul 13.pdf

WILDFIRE MITIGATION LAW IN THE MOUNTAIN STATES OF THE AMERICAN WEST: A COMPARATIVE ASSESSMENT

A White Paper

compiled as a group research project in
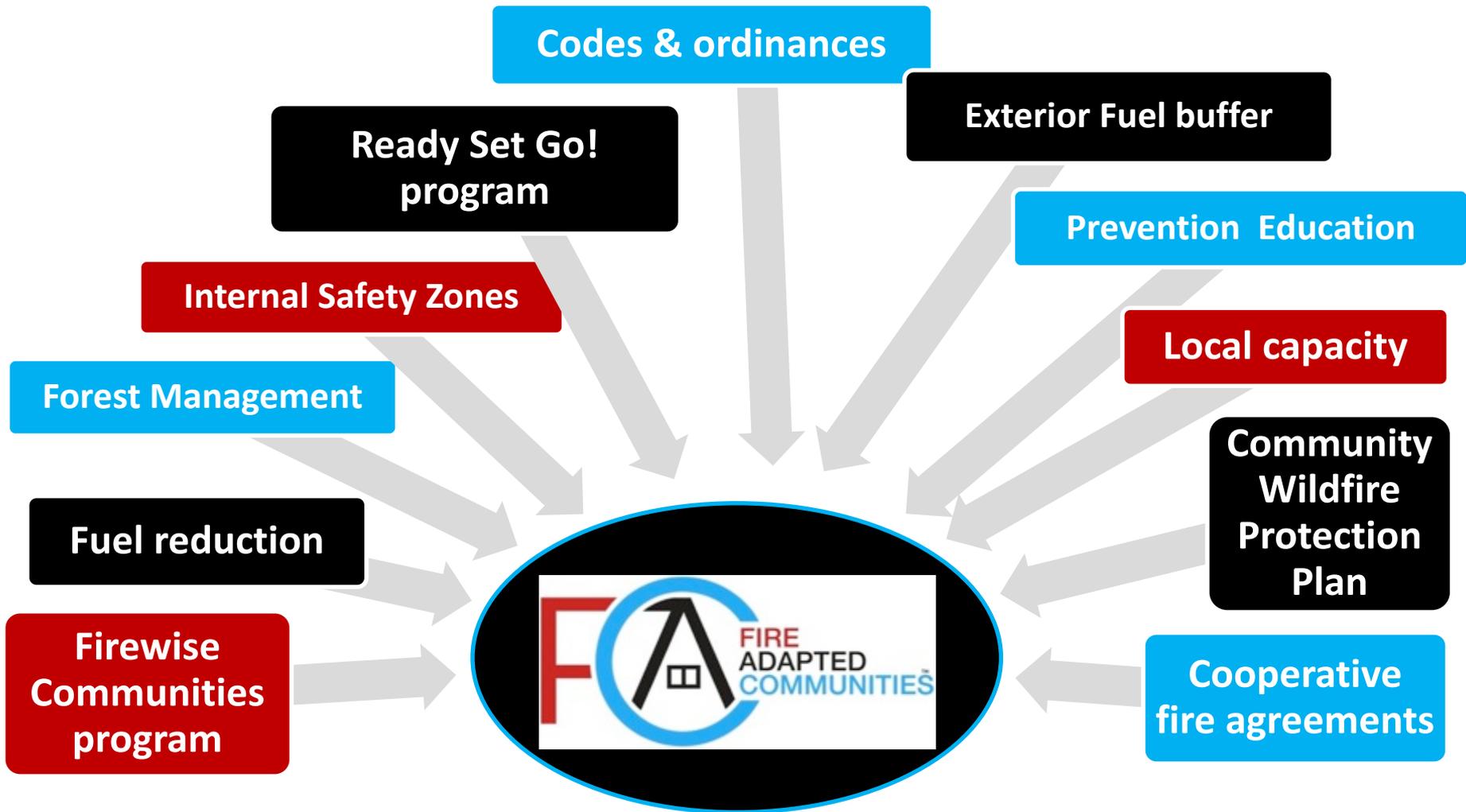
PUAD 5450. Law of All-Hazards Management

Fall term, 2012.

School of Public Affairs
University of Colorado Denver

Lloyd Burton, PhD.
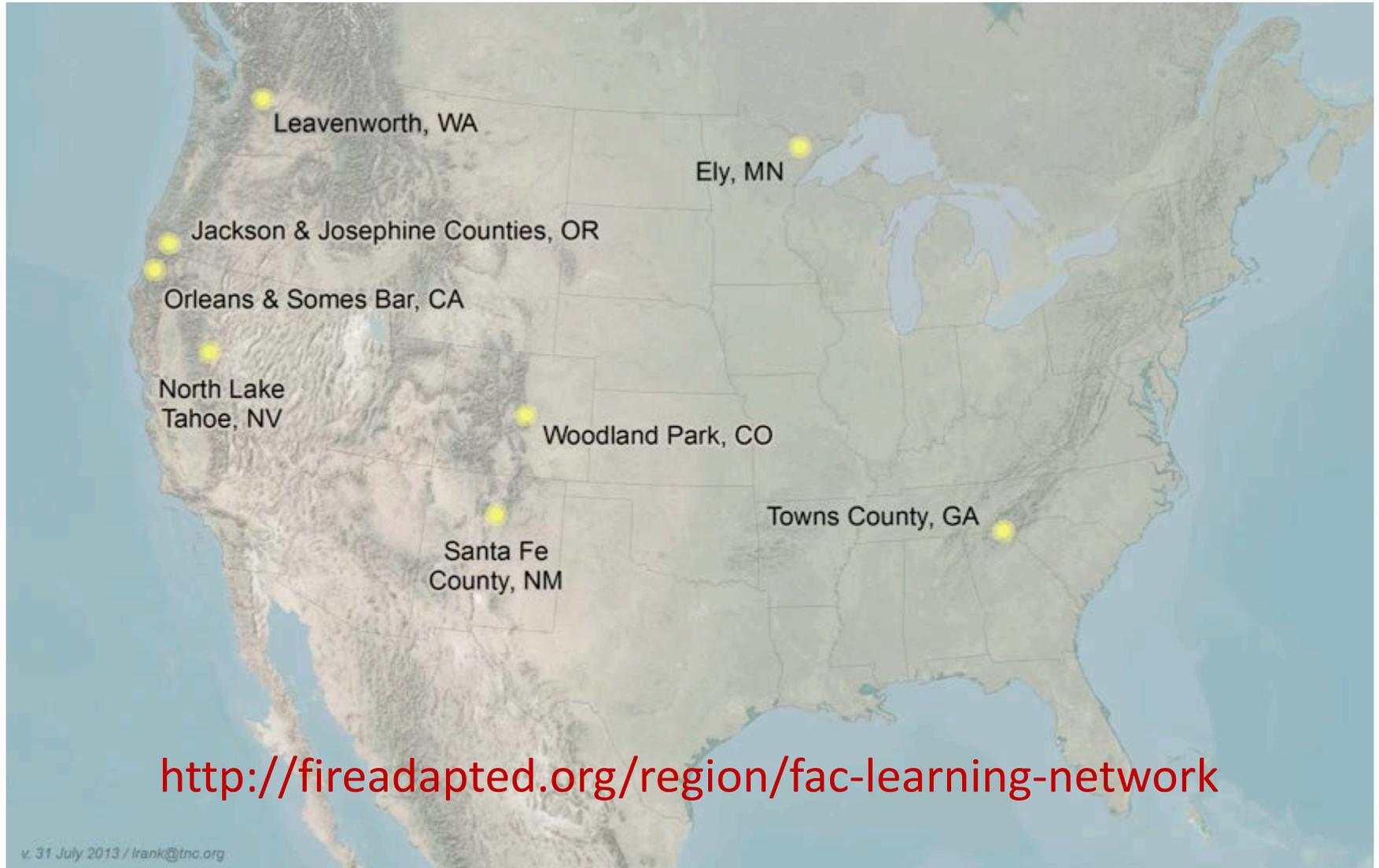Course Professor and Author/Editor

Posted online
July, 2013.

# The fire adapted community toolkit

Codes & ordinances

Exterior Fuel buffer

Ready Set Go! program

Prevention Education

Internal Safety Zones

Local capacity

Forest Management

Community Wildfire Protection Plan

Fuel reduction

Firewise Communities program

Cooperative fire agreements

FAC FIRE ADAPTED COMMUNITIES

# www.fireadapted.org

# FAC Learning Network



http://fireadapted.org/region/fac-learning-network

# Thank You

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# Questions and Answers

## Ask questions through the chat pod

# Give us your feedback!

www.fs.fed.us/openspace/webinars

Or Contact

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