Social and Economic Research

Fire is a
Biophysical
Process

Fire Management
is a
Social Process

Social Dynamics…..

Determine

- What we Value
- The Decisions we make

Portfolio C
Social Fire Science

- Public Interactions
- Socio Economic Effects
- Organizational Effectiveness

Overview

- **Prior to 1998 – Fire social science research was very limited and sporadic**
- **Since 1998 -- substantial research on pre-fire social dynamics**
  - **Primarily with National Fire Plan or Joint Fire Science Program funding**
  - **Conducted by scientists at all 5 Research stations and dozens of universities**
  - **Local to international focus**
- **Increasing research on during and post-fire social dynamics**

Capacity – Public Interactions

(3FTE)

- Northern Research Station
  - 2 scientists, (1.25 FTE)
- Pacific Northwest Research Station
  - 1 scientist, (.5 FTE)
- Pacific Southwest Research Station
  - 2 scientists (1 FTE)
- Rocky Mountain Research Station
  - 3 scientists (1.5 FTE)
- Southern Research Station
  - 1 scientist (.25 FTE)

Capacity – Socio economic effects

(6FTE)

- Northern Research Station
  - 1 scientist (.25 FTE)
- Pacific Northwest Research Station
  - 1 scientist (.75 FTE)
- Pacific Southwest Research Station
  - 1 scientist (1 FTE))
- Rocky Mountain Research Station
  - 3 scientists (2.5 FTE))
- Southern Research Station
  - 4 scientists (1.5 FTE)

Capacity Considerations

- Number of social scientists working on fire research has decreased since 2007 (retirements and interest)

- Almost all of the work is conducted in cooperation with a diverse array of universities

Universities I've worked with…..

- Colorado State University
- Florida State University
- Michigan State University
- North Carolina State Univ
- Ohio State University
- Oregon State University
- Pennsylvania State Univ
- University of Arizona
- University of California/ UCLA
- University of Colorado
- University of Florida
- University of Massachusetts
- University of Oregon
- Virginia Polytechnic
- Cornerstone Strategies

Topic Areas – *Public Interactions*

Long-Standing and Continuing Areas

- Mitigation on Private land
  (Defensible Space)
- Acceptability of Fuels
  Management on Public Lands
- Community Preparedness
- Collaboration
- Communication
- Wildland-Urban Interface/Demographic Change

Fire Adapted Communities

Topic Areas – *Public Interactions*

Newer Areas of work

- Fire Adapted Communities
- Public Acceptance of Smoke
- During Fire Dynamics
  - Evacuation Decision Making
  - Agency – Community Interactions
- Post-Fire Dynamics
  - Long-term Health Impact
  - Re-Building
- Systems level analysis

Topic Areas – *Socio-economic*

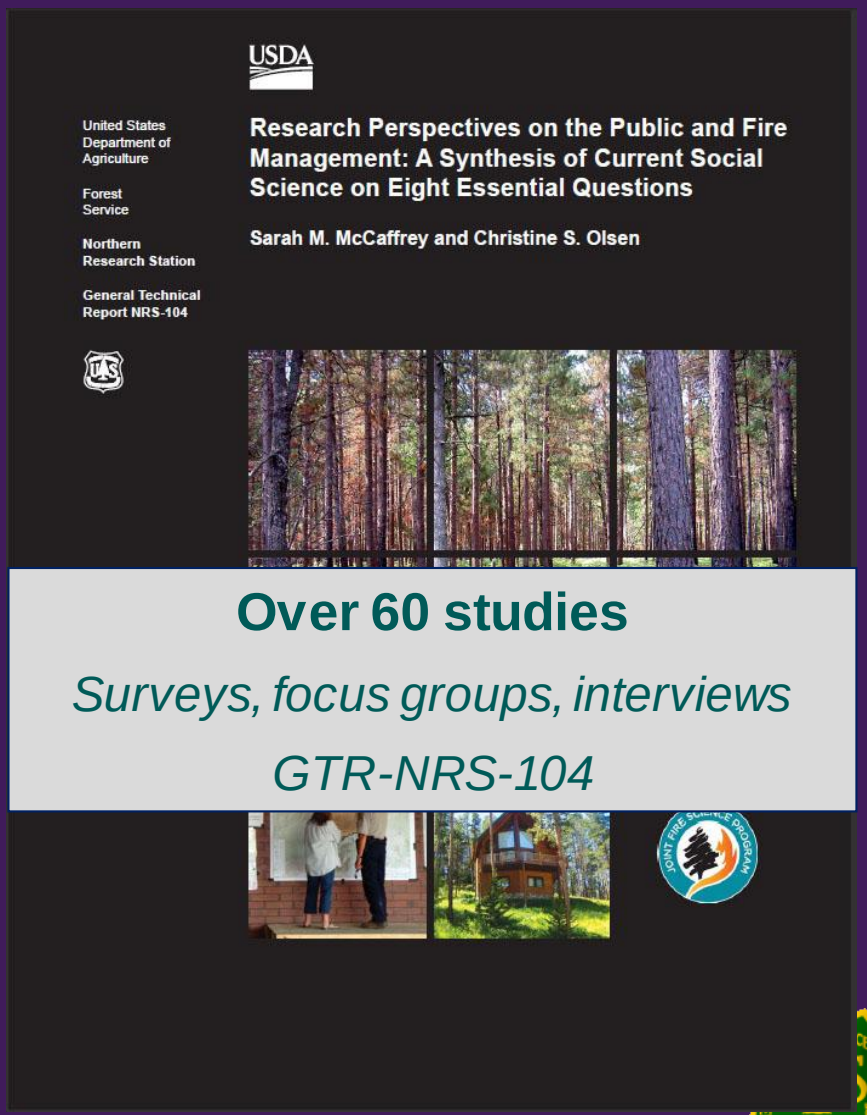
- Modeling
  - Relative contribution of suppression, prevention, climate change
  - Forest management outcomes across ownership
  - Optimizing fuel treatments (costs)
  - Efficacy of fuels management

Topic Areas – *Socio-economic*

- Forecasting
  - Suppression costs
  - Incendiary fires
- Cost/benefit / Willingness to Pay
  - Mitigation
  - Wildfire response

Recent Syntheses of Social Science Research

84 articles on homeowner mitigation
83 articles on public acceptance of fuels treatments on public lands
(Published or in press as of 12/31/2010)



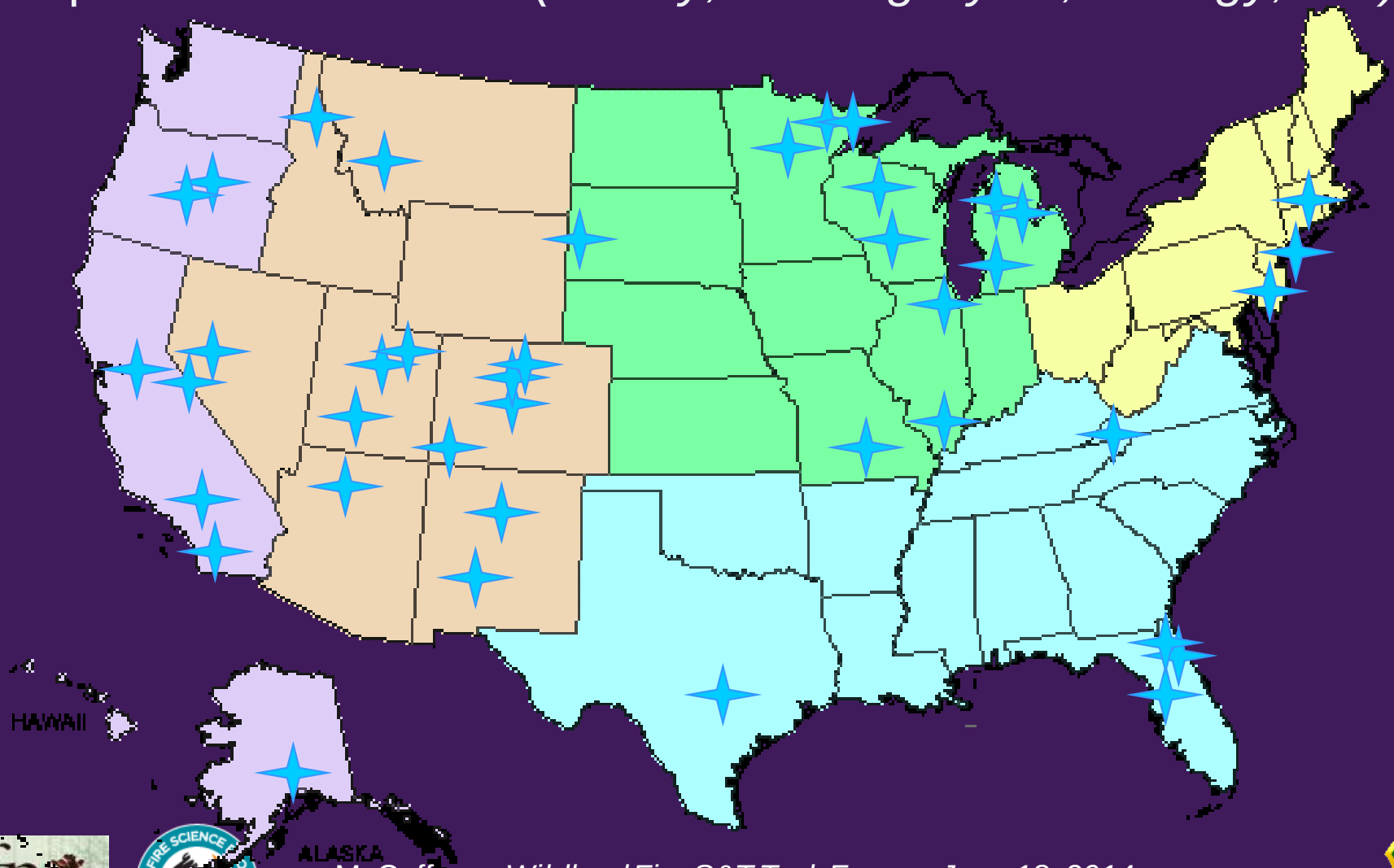
Over 60 studies

Surveys, focus groups, interviews

GTR-NRS-104

(My) Research Sites *(up to 2006)*

Few clear geographic differences – differences appear result of specific local context *(history, building styles, ecology, etc.)*



NSTC 2009 Grand Challenges

Grand Challenge #3: Develop hazard mitigation strategies and technologies.

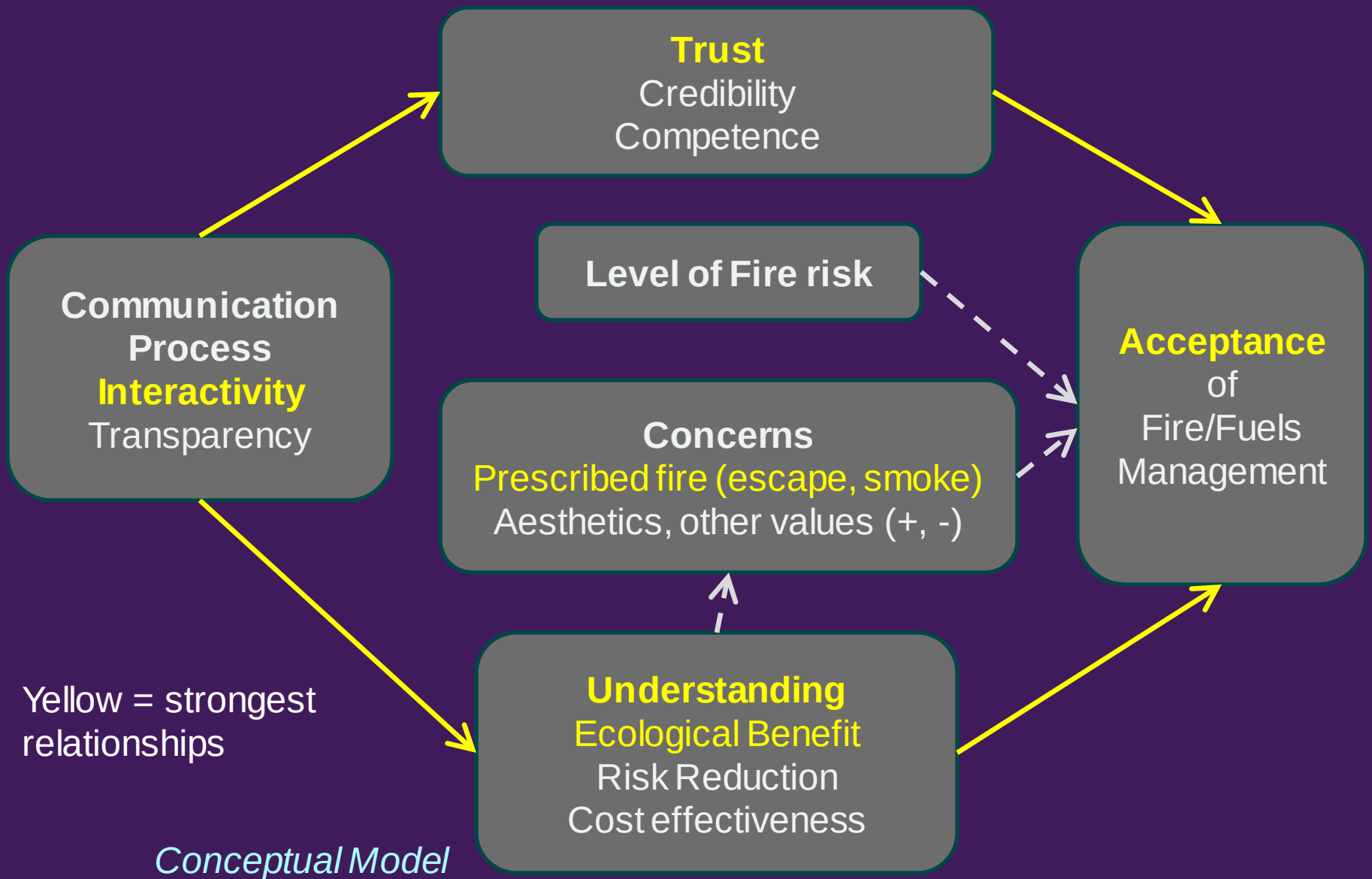
- **Assess the benefits of fuel treatments, other preparedness activities, societal attitudes and decision-making processes in reducing potential impacts;**
- **Improve understanding of costs and benefits of wildland fire and fuel management;**
- **Understand the factors that motivate individuals to undertake risk mitigation activities.**

Overall findings do not support many of the Conventional Wisdoms about public response to fire management.

- Most People
  - Do know they live in high fire risk areas *(other factors also influence action)*
  - Understand the ecological benefits of fire (and prefer active forest management)
  - Feel responsible for mitigation on their property *(but see the responsibility as shared by all property owners- including public agencies)*
- Demographics aren't good predictors

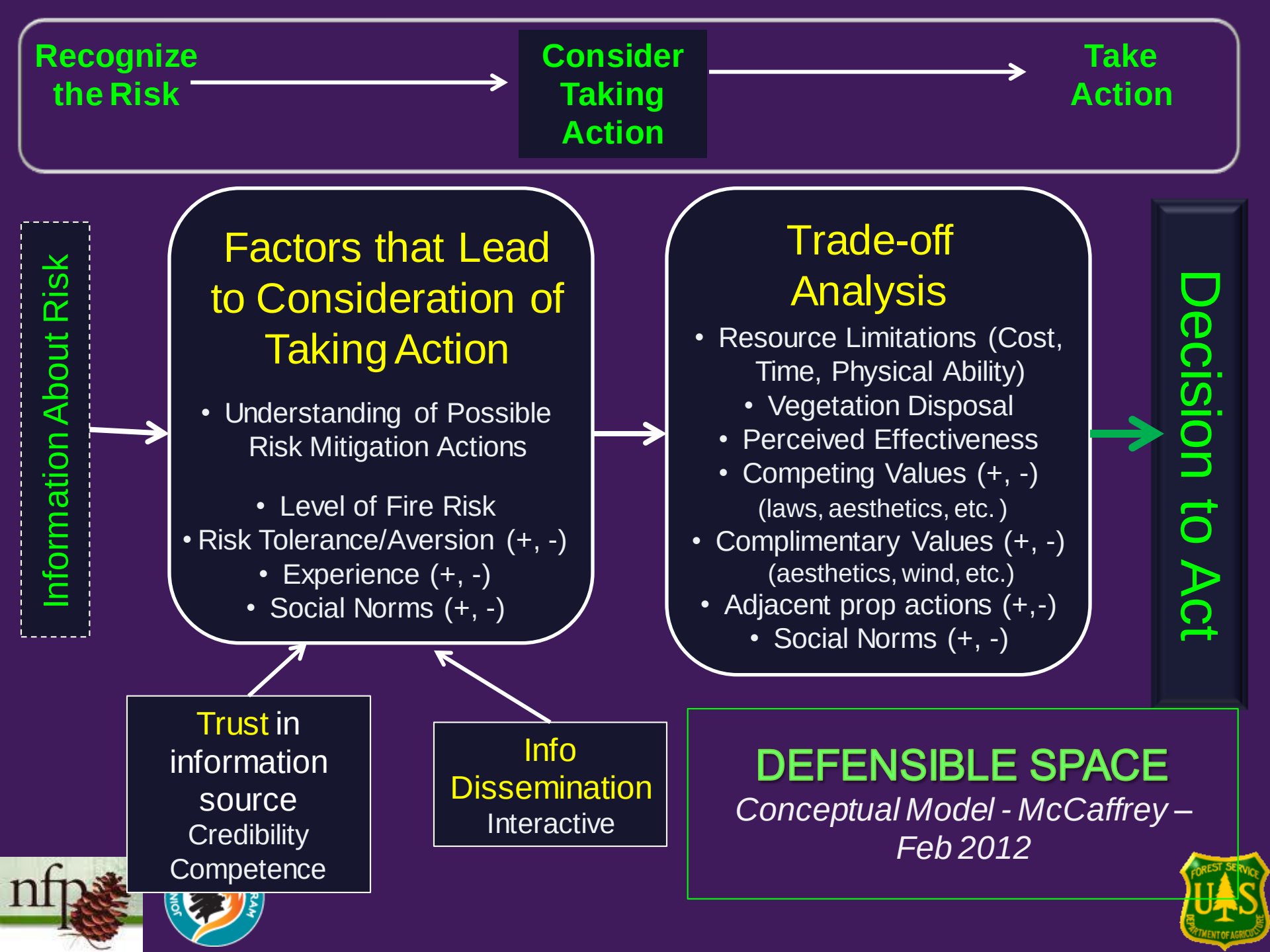
Fire/Fuels Management Public Acceptance Model

(Thinning, Prescribed Fire, WFU)



Yellow = strongest relationships

Conceptual Model
McCaffrey -Feb 2012


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 prop actions (+,-)
• Social Norms (+, -)
Decision to Act
Trust in information source
Credibility
Competence
Info Dissemination
Interactive
DEFENSIBLE SPACE
Conceptual Model - McCaffrey – Feb 2012

NSTC 2009 Grand Challenges

Grand Challenge #5: Assess disaster resilience.

- **Understand why individuals evacuate or choose to stay;**
- **Establish methods to assess the adequacy of community resources for a successful response to a likely fire hazard;**
- **Develop improved systems to assist homeowners and communities to recover from impacts of wildland fire;**

Evacuation Decision Making

- Threes general groups
  - Those who evacuate early or as soon as an order is in place (~35%)
  - Those who stay and defend (~10%)
  - Those who “wait and see” (~45%)
- Risk response may influence actions
- Those who “wait and see” may pay more attention to physical & social cues over official cues
- Those who plan to stay tend to have done more to prepare their property

Communication During Fires

- People use multiple sources to triangulate
- Interactive sources generally seen as more useful and more trustworthy, especially for those most affected
- Info that comes from "official" sources is most useful and trusted
- Media generally not seen as useful or trustworthy.
- Transparency, setting realistic expectations, and interactivity are key process characteristics

Dissemination

- Publications *(journal, GTR, one page summary, etc*
- Interactive work
  - Integration in training courses (RX 310, Wildland Fire Use, WFDSS training, etc.)
  - Workshops and Conferences
  - Formal Presentations and Individual Consultations
    - Within FS (District Rangers, FMOs, PAOs,, IC's & IMT's, WO, etc.)
    - Interagency (WFLC, NWCG, NPS, BLM, BIA, USFWS)
    - External (TNC, FireSafe Councils, Insurance Companies, Orange County Fire Authority, etc.).

Gaps? – many……

Additional Thoughts

- User driven science, (not just managers)
- Over reliance on Tech
  - New ways of thinking and validation can be equally useful
  - Importance of community assistance
- Perhaps need to think beyond a single response/message process

The Reviews…

- "Absolutely invaluable" (WO)
- "It's my Bible" (New South Wales)
- This looks magnificently helpful, and I have forwarded it to the fire managers in my area." (Mendocino Fire Safe Council)
- "There was a whole lot of enlightening going on!" RX-310
- "I am impressed with the rapid deployment, the value of the products, and the attitude of those involved." (Region 5 F&AM Director)