Fire is a Biophysical Process

Fire Management is a Social Process

McCaffrey – Wildland Fire S&T Task Force – June 18, 2014
Forest Service – Socio Economic
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
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)

Trust
- Credibility
- Competence

Level of Fire risk

Concerns
- Prescribed fire (escape, smoke)
- Aesthetics, other values (+, -)

Understanding
- Ecological Benefit
- Risk Reduction
- Cost effectiveness

Acceptance of Fire/Fuels Management

Communication Process
- Interactivity
- Transparency

Yellow = strongest relationships

Conceptual Model
McCaffrey - Feb 2012
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 (+, -)

DEFENSIBLE SPACE
Conceptual Model - McCaffrey – Feb 2012
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)