99-1-2-1

# Antecedents to attitudes toward prescribed burning, mechanical thinning and defensible space fuel reduction techniques

ISSRM Conference, Bloomington, IN June, 2002


***Authors***

Christine Vogt
Greg Winter
Jeremy Fried

***Other researchers on the project***

Keith Gilless
Armando Gonzalez-Caban
David Weise
Demetrios Gatziolis



*We appreciate funding provided by the Joint Fire Sciences Program and USDA Forest Service North Central Research Station*


# What we've learned so far…

- Importance of acceptance of fuel mitigation techniques varies by:
  - Fuel treatment (FT) type
  - Site characteristics (*especially* past agency performance)
  - Attitudes toward fuel treatments are potentially influenced by many variables
- Managers need to:
  - Listen to residents' reasons for non-acceptance
  - Let beliefs about FT outcomes & FT attitudes guide development of FT programs
  - Deliver information that responds to likely concerns

# Objectives of Study

- Understand WUI residents' acceptance of fuel treatment techniques
- Build models that predict acceptance
- Empower fire managers with analytic tools to collect & analyze acceptance related information from residents
- Further improve on the level of public participation in land and resource issues and management plans

# Theoretical Framework for Studying Human Acceptance of Fuel Reduction

Selected part of the Theory of Reasoned Action to guide and structure our inquiry

**Belief**
Outcome Evaluation
*Good/bad*

**Belief**
Likelihood a fuel treatment will produce an outcome
*Very likely/unlikely*

**Attitude toward fuel treatments**
*Positive/negative*

**Intent**
Acceptance of fuel treatment
*"Vote for"*

# Components of the study

- Phase 1 – Fire manager and resident **focus groups** in 4 study areas to develop conceptual model
- Phase 2a – Design nationally applicable survey instrument to assess acceptance of fuel treatments
- Phase 2b – Administer the **survey** in three study areas
- Phase 2c – Build and test predictive model using survey data and conceptual model from phase 1
- Phase 3 – **Spatial analysis** of survey results in the context of geographically referenced fuel and fire history data

**Marin, CA**
•Grass, chaparral, oak,
•Conifer
•High valued homes
•Federal, state lands
•Rare wildfire, non-existent Rx fire, intense suppression

**Tuolumne, Placer, El Dorado, CA**
•Oak woodland, pine, mixed conifer
•Federal forest
•Frequent wildfire, rare Rx fire

Yellow = Focus Group
Red = Survey
Orange = Both

**Oscoda, Crawford, Iosco, Ogemaw, MI**
•Jack pine
•Many seasonal homes
•Federal, state forest
•Moderately frequent Rx and wildfire

**Clay, FL**
Pine
Some seasonal homes
Private forest ownership
Frequent wild and Rx fire

## Focus Group Results Reveal Personal Importance as a Possible Significant Variable

- Vegetation amenity – desire to live with "all the trees"
- Property rights – desire for autonomy, privacy
- Smoke impacts – subgroups that are smoke sensitive

## Focus Group Results Reveal Personal Experiences as a Possible Significant Variable

- Living in the area during a significant fire
- Volunteering or working for various fire departments
- Living in the area and seeing fire crews perform prescribed burning or mechanical thinning
- Learning about defensible space programs through local fire agencies or home owner associations

## Focus Group Results Reveal Situational Specifics as a Possible Significant Variable

- How much area involved
- How much pre-planning undertaken
- Sufficiency of firefighting resources
- Proximity to developed areas

## Focus Group Results Reveal Agency Trust as a Possible Significant Variable

- Ability to control fire
- Professional skills
- Agency credibility and communication effort

## Focus of this Presentation and Paper

- Extend the Theory of Reason Action model to include other significant predictors of attitudes and intentions to accept fuel treatments.
- Based on our focus group findings, we examined:
  - Fuel treatment experiences and actions
  - Personal relevance of fuel treatments
  - Trust in government as managers of wildlands
- Using univariate statistics with survey data from the areas studied in three states

## Survey

- Statistically representative sample
- Clay County, FL, El Dorado/Placer Counties, CA, and Oscoda/Ogemaw/Crawford, MI
- 1,200 surveys sent per site in FL and CA; 2,400 surveys sent in MI
- Treatments: Rx fire, mechanical, defensible space
- Standard Dillman mail survey methods used
- Timing of mailing and 9/11 and anthrax may have influenced response rate for FL and CA
- Response rates were 32% FL, 48% CA, and 53% MI.

# Topics of survey questions

- Fuel treatment acceptance
- Attitudes towards fuel treatment
- Beliefs about fuel treatment outcomes
- Personal importance/level of concern
- Agency trust
- Past experiences with fire
- Past actions to protect against fire
- Nature of residency and tenure with area

# Intentions to Support Fuel Reduction Techniques

Percent who report they'd **vote No**

| | County | | |
|---|---|---|---|
| | Clay, FL | El Dorado/Placer, CA | Oscoda/Ogemaw/ Crawford, MI |
| Rx Burning | 13% | 29% | 53% |
| Mechanical Treatment | 21 | 12 | 27 |
| Defensible Space | 58 | 25 | 57 |

# Attitudes Toward Fuel Reduction Techniques

**Scale of "1" equaled extremely negative and "7" equaled extremely positive**

| | County | | |
|---|---|---|---|
| | Clay, FL | El Dorado/Placer, CA | Oscoda/Ogemaw/ Crawford, MI |
| Rx Burning | Mean =5.7 (sd=1.4) | 5.1 (1.7) | 4.0 (1.9) |
| Mechanical Treatment | 5.3 (1.5) | 5.8 (1.3) | 5.0 (1.6) |
| Defensible Space | 4.3 (1.9) | 5.8 (1.6) | 4.2 (2.0) |

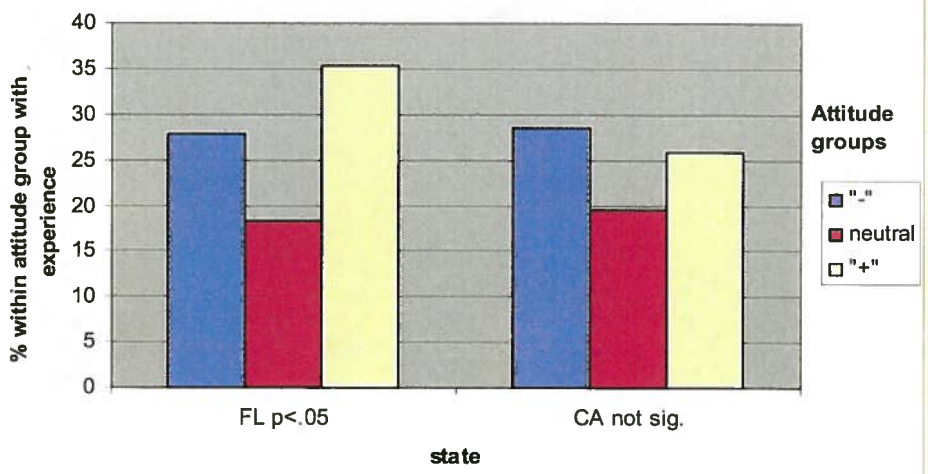
# Belief Outcome Evaluation

**Scale of "1" equaled extremely bad and "7" equaled extremely good**

| | Clay, FL | El Dorado/Placer, CA | Oscoda/Ogemaw/ Crawford, MI |
|---|---|---|---|
| **Could allow out of control fires** | **Mean=2.3 (sd=1.5)** | **2.1 (1.5)** | **2.0 (1.4)** |
| **Impacts scenery** | **3.8 (1.4)** | **3.7 (1.5)** | **3.2 (1.5)** |
| **Extracts usable wood products** | **4.5 (1.6)** | **5.3 (1.6)** | **4.6 (1.7)** |
| **Creates more smoke in short-term, but less smoke over time** | **4.9 (1.4)** | **4.9 (1.4)** | **4.1 (1.3)** |
| **Restores wildlands to a more natural condition** | **5.8 (1.2)** | **5.6 (1.2)** | **5.4 (1.4)** |
| **Saves money by reducing the cost of fighting a wildfire** | **5.9 (1.2)** | **5.8 (1.3)** | **5.2 (1.5)** |
| **Improves conditions for wildlife** | **6.1 (1.3)** | **6.0 (1.2)** | **5.9 (1.4)** |

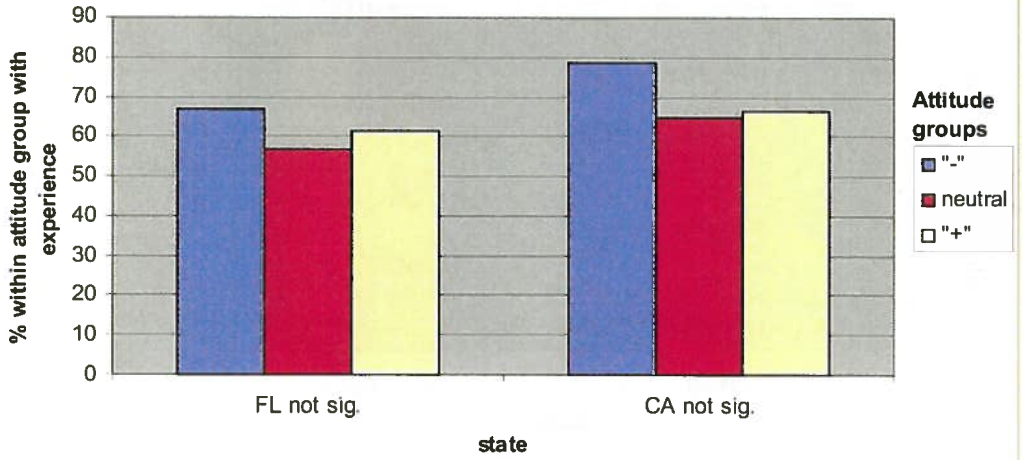
**Relationship between personal experience with prescribed burning and attitude toward prescribed burning**

*significant relationship when state not controlled for*



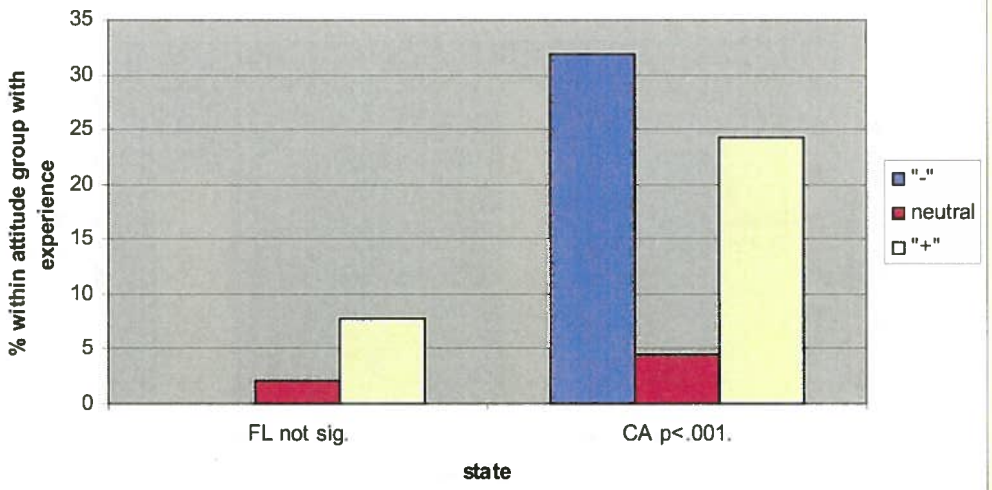

**Relationship between personal experience with smoke discomfort and attitude toward prescribed burning**

*significant relationship when state not controlled for*



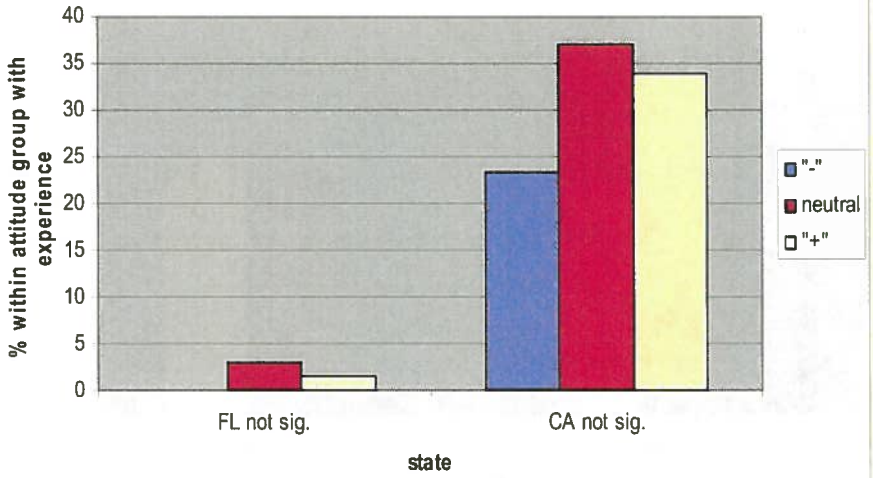
**Relationship between personal experience with mechanical thinning and attitude toward thinning**

*significant relationship when state not controlled for*



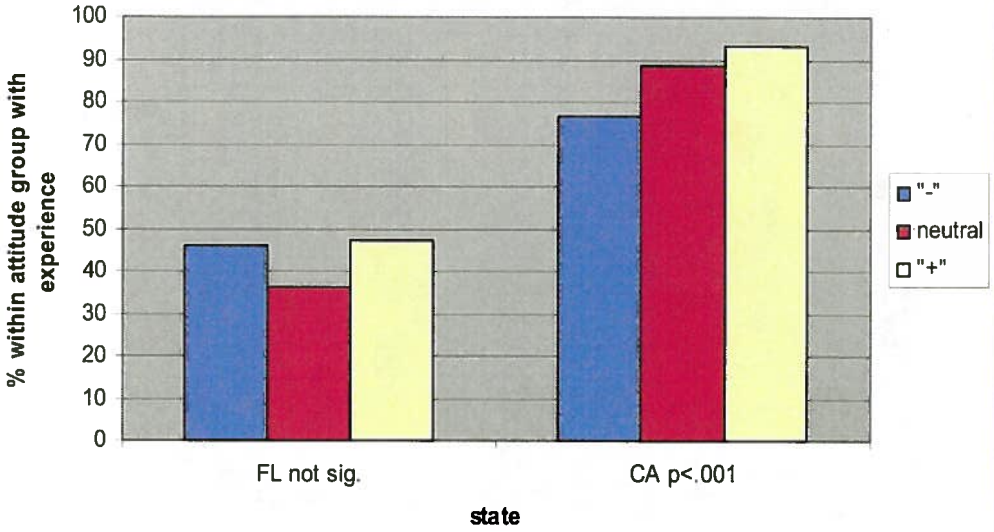

**Relationship between personal experience of being required to remove flammable vegetation on property and attitude toward defensible space**

*significant relationship when state not controlled for*



**Relationship between personal experience of removing flammable vegetation and attitude toward defensible space**

*significant relationship when state not controlled for*

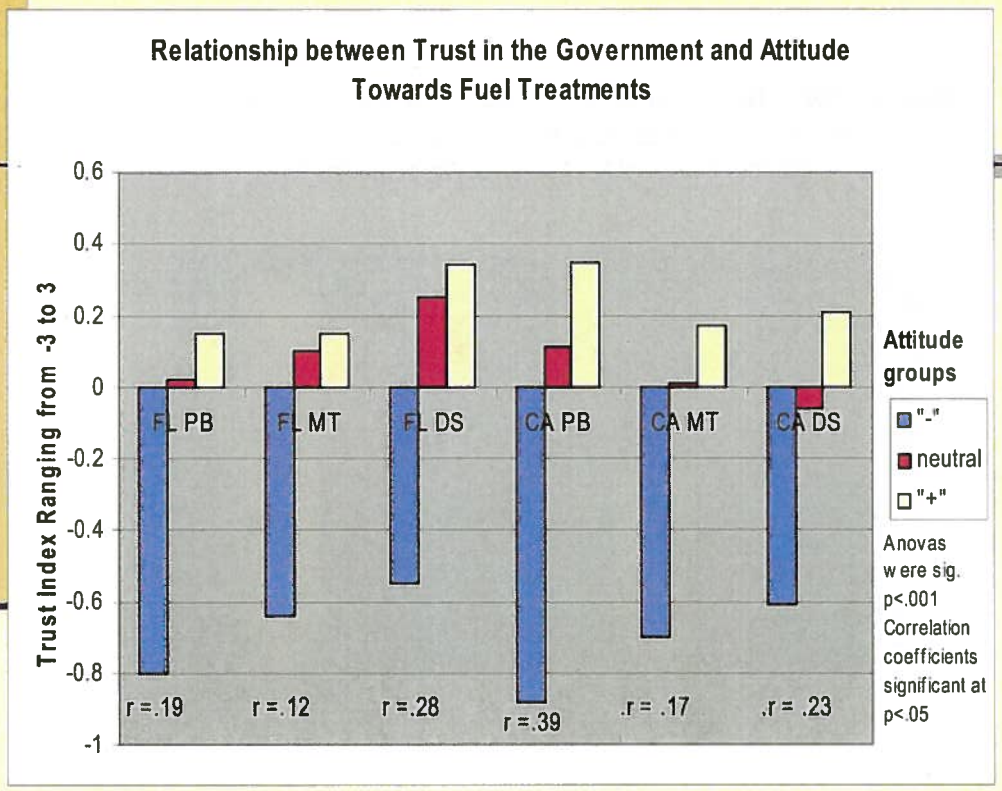



# Relationship between Personal Importance and Attitude toward Fuel Treatments

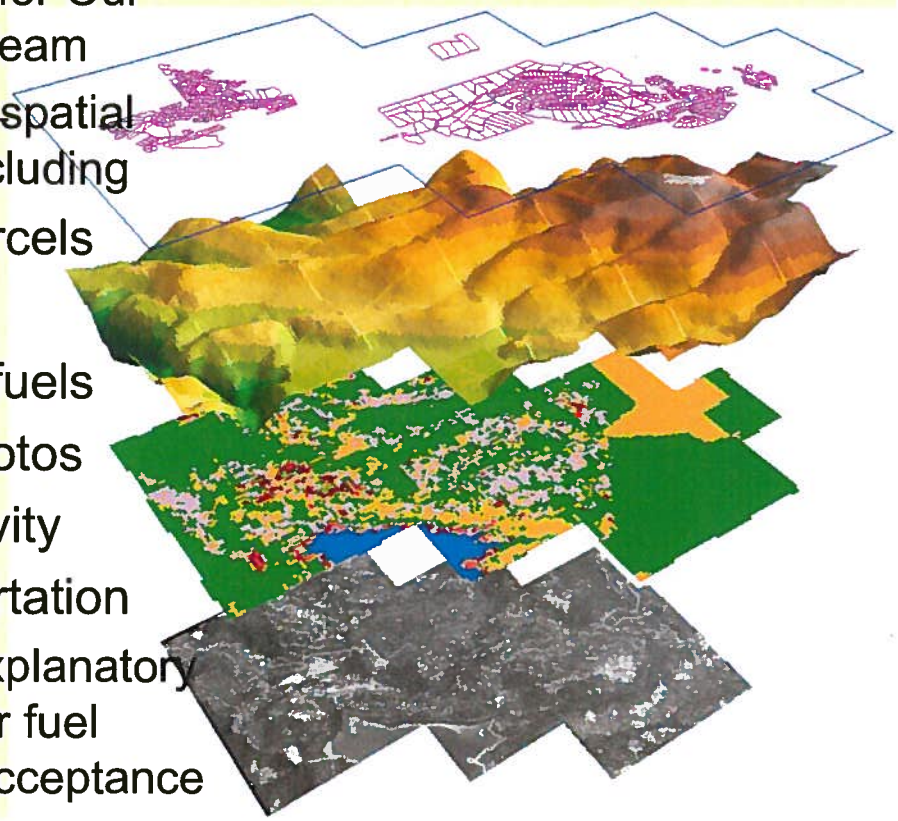
**How important are each of the fuel treatment programs as they are practiced in your county? And, How would you rate your general attitude toward each of the three fuel management approaches?**

| Correlation coefficients on 7-pt scales | Clay, FL | El Dorado/Placer, CA |
|---|---|---|
| Rx Burning | r=.57 | .62 |
| Mechanical Treatment | .60 | .61 |
| Defensible Space | .68 | .79 |

*all significant at p<.01 level*




# Summary Points

- Importance of acceptance factors varies by:
  - FT type
  - Site characteristics or geographic area
  - Experiences with fuel treatments
  - Personal relevance of each fuel treatment
  - Trust in government to reduce fire risk
  - Interactions among these variables
    - Measurement of a multitude of social science variables is necessary
    - Sophisticated modeling to understand acceptance

- Next Steps for Our Research Team
- ~~Assembled~~ spatial datasets including
  - Land parcels
  - DEMs
  - Current fuels
  - Orthophotos
  - Fire activity
  - Transportation
- Will build explanatory variables for fuel treatment acceptance