

Predicting social acceptance of fuel-treatments: You have to ask, they have to trust

presented to

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Objectives

- ◆ Design and test survey of knowledge, understanding and acceptance of fuel treatments at wildland-urban interface
 - ❖ Three treatment approaches
 - Prescribed burning, mechanical treatment, defensible space
 - ❖ National scope, three survey sites
 - California, Florida, Michigan
- ◆ Explore factors upon which acceptance depends
- ◆ Assess spatial dependence of acceptance and its antecedents
- ◆ Construct demographic and geographic models of fuel treatment acceptance

Study Sites

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

Blue = Both

Oscoda, Crawford, Ogemaw, MI

- Jack pine
- Many seasonal homes
- Federal, state forest
- Moderately frequent Rx fire and wildfire

Clay, FL

- Pine
- Some seasonal homes
- Private forest ownership
- Frequent wild and Rx fire

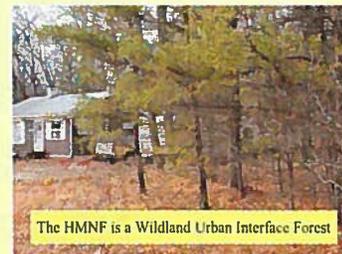


Hypothesized predictors of approval

- ◆ Demographic (age, income, health, education ...)
- ◆ Spatial context (e.g., fuels, house & road density, past fires)
- ◆ Theory of Reasoned Action
 - ❖ Beliefs predicting attitude
 - ❖ Attitude predicting approval
- ◆ Other factors?
 - ❖ Personal experience with fire and fuel treatment
 - ❖ Trust in agency
 - ❖ Personal importance of fuel treatments
 - ❖ Concern that wildfire could change life
 - ❖ Test spatial continuity; assess opportunity for targeted message

Demographics don't predict acceptance

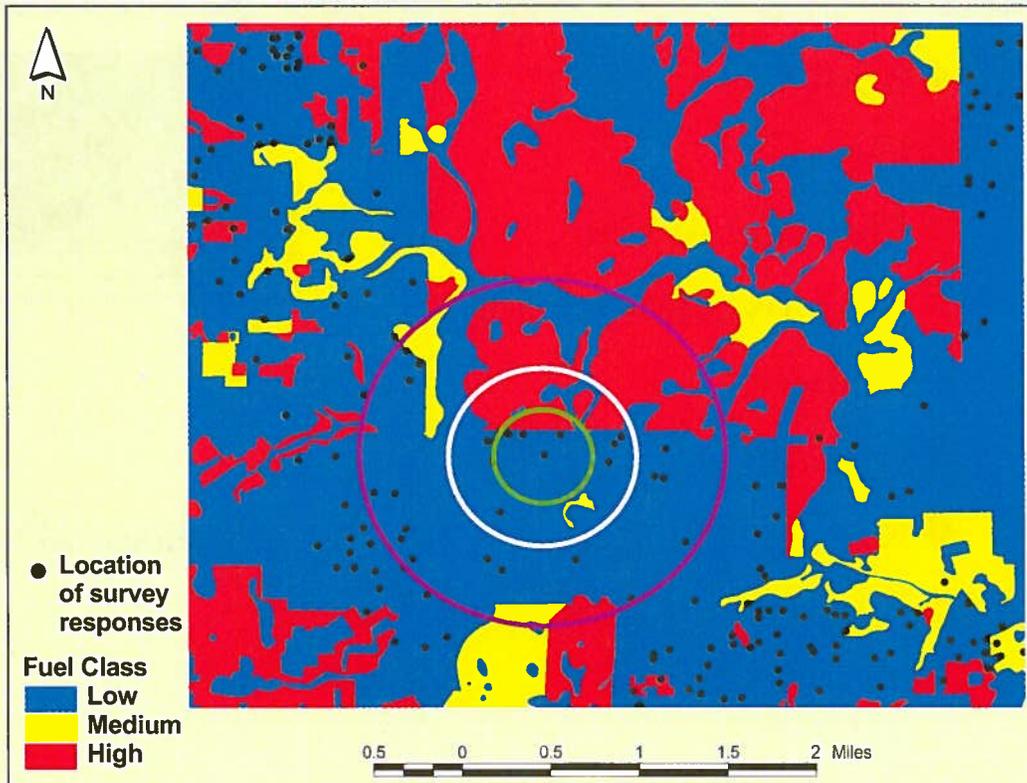
- ◆ Education
- ◆ Gender
- ◆ Household size
- ◆ Employment status
- ◆ Tenure
- ◆ Income
- ◆ Residential status (year-round, seasonal)
- ◆ Respiratory ailment status



House locations precisely georeferenced



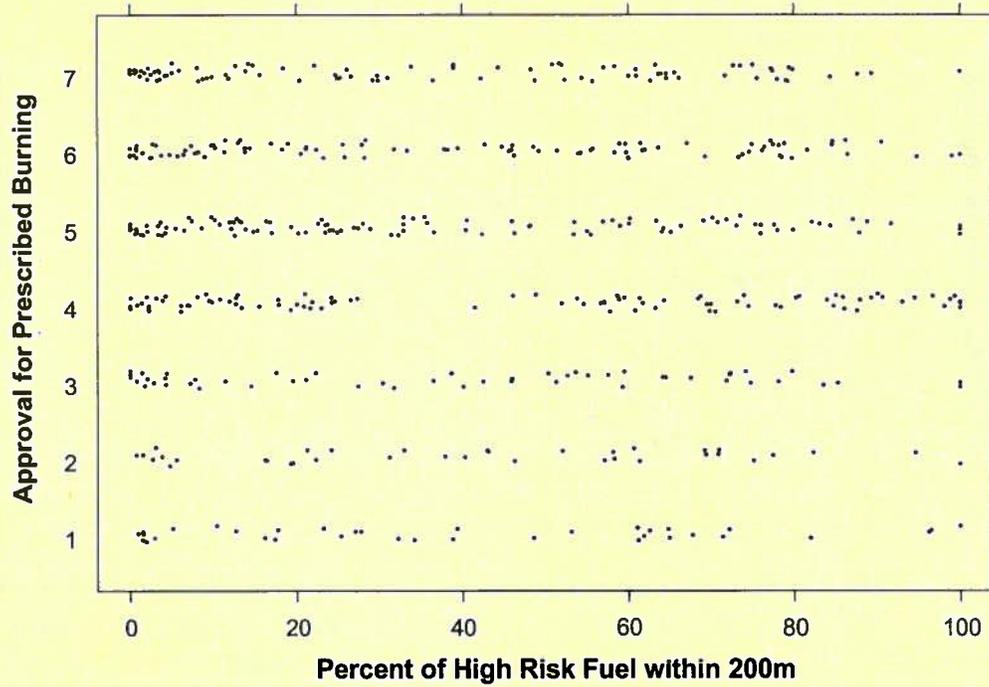
Fuel risk within 1/4, 1/2, and 1 mile- Florida



Prescribed burning/high risk fuel



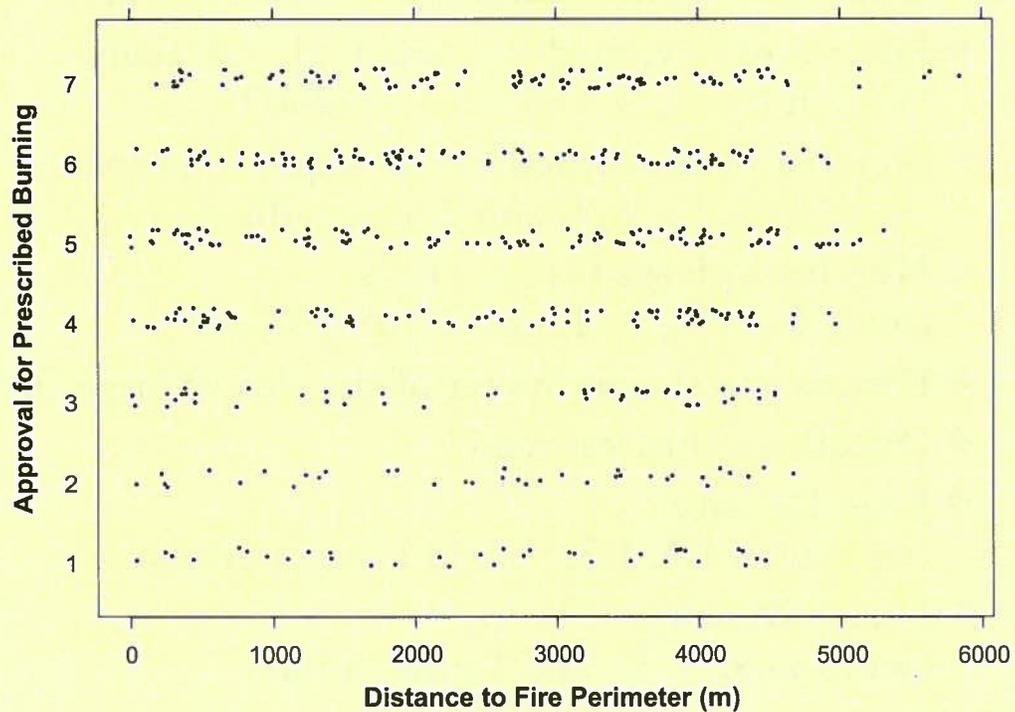
California



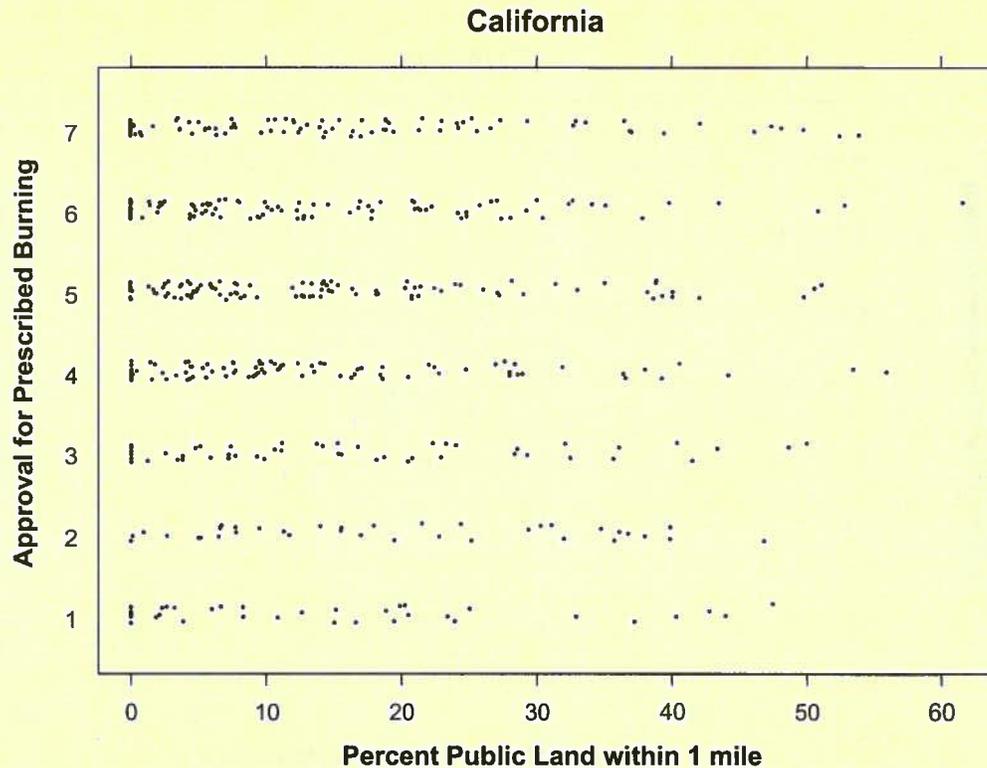
Prescribed burning/distance to fire



California



Prescribed burning/public land abundance



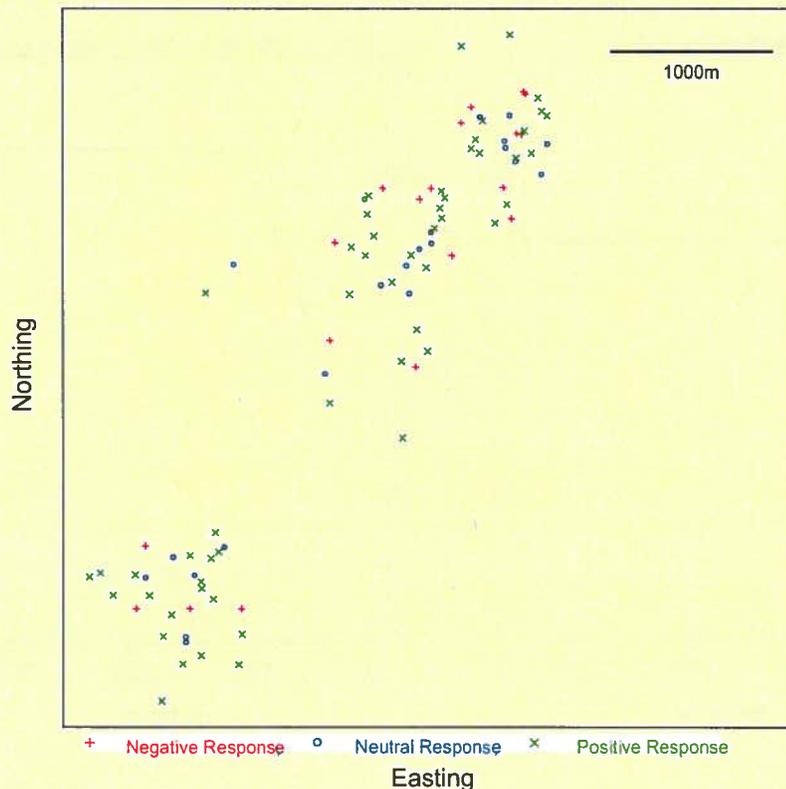
Geography doesn't predict acceptance

- ◆ Distance to low, medium, and high risk fuels
- ◆ Percent of low, medium, and high risk fuels (within 1/8, 1/4, 1/2, and 1 mile radius)
- ◆ Number of fires since owner acquired property (within 1/8, 1/4, 1/2, 1, and 2 mile radius)
- ◆ Number of large (>40 ac) fires (within 1/8, 1/4, 1/2, 1, and 2 mile radius)
- ◆ Distance to the perimeter of the closest large fire
- ◆ Distance to nearest road
- ◆ Road Density (within an 1/6, 1/3, 1/2, and 1 mile radius)
- ◆ House Density (within 1/8, 1/4, 1/2, and 1 mile radius)

Tests of spatial continuity

- ◆ If spatial autocorrelation, then
 - ❖ Acceptance would be clustered, perhaps by neighborhood
 - ❖ Education could be targeted
 - ❖ More efficient surveys would be possible
- ◆ Performed variogram analysis to test for spatial continuity on every survey question
 - ❖ Ordinal scales required use of indicator variograms (conversion to binary variables)

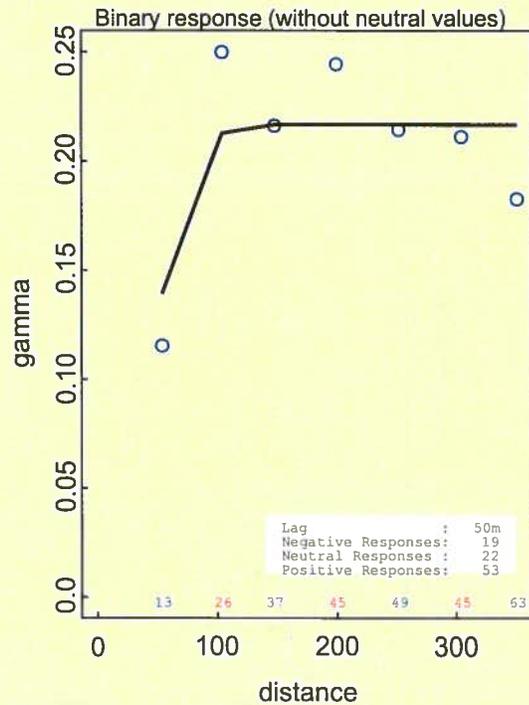
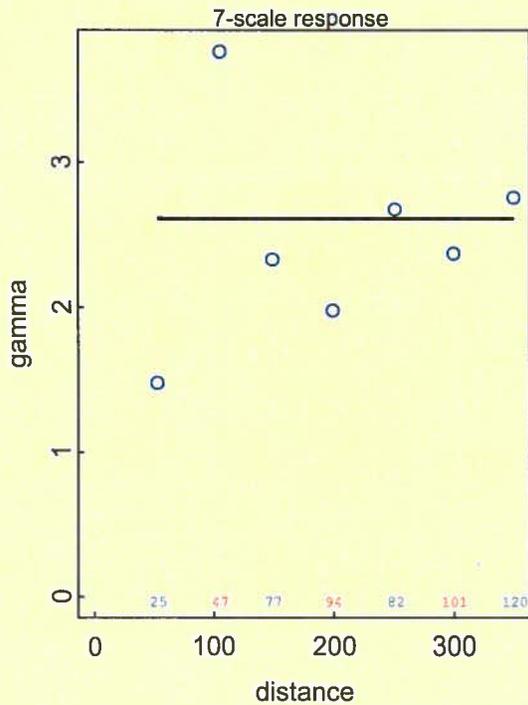
Approval of prescribed burning



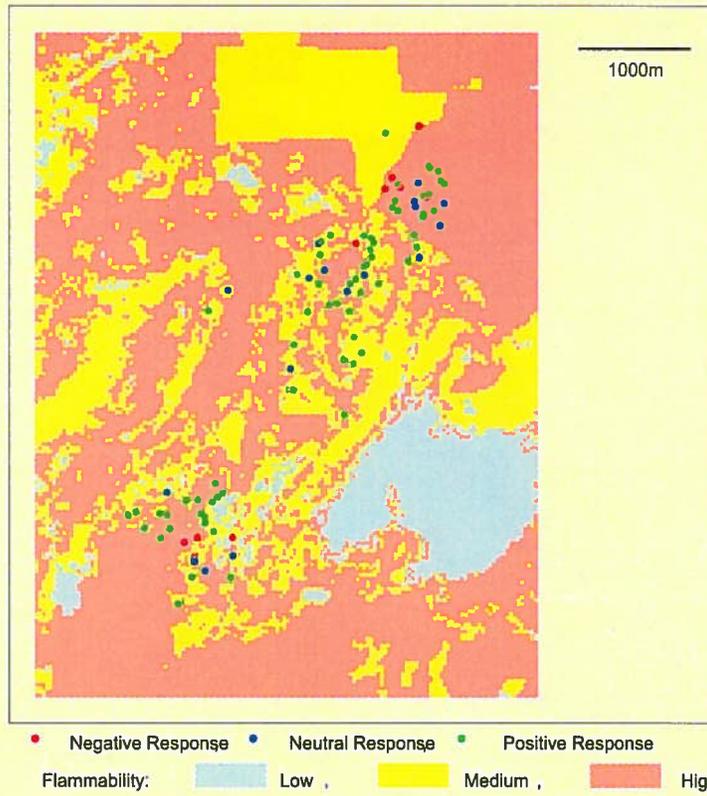
Approval of prescribed burning



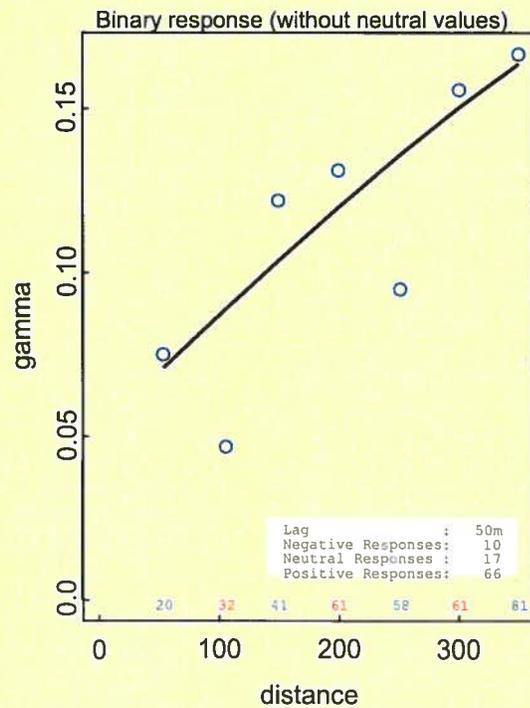
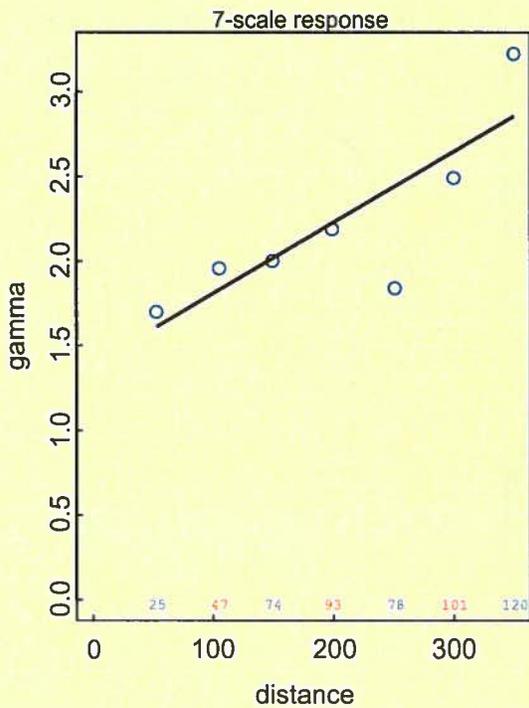
Approval of prescribed burning



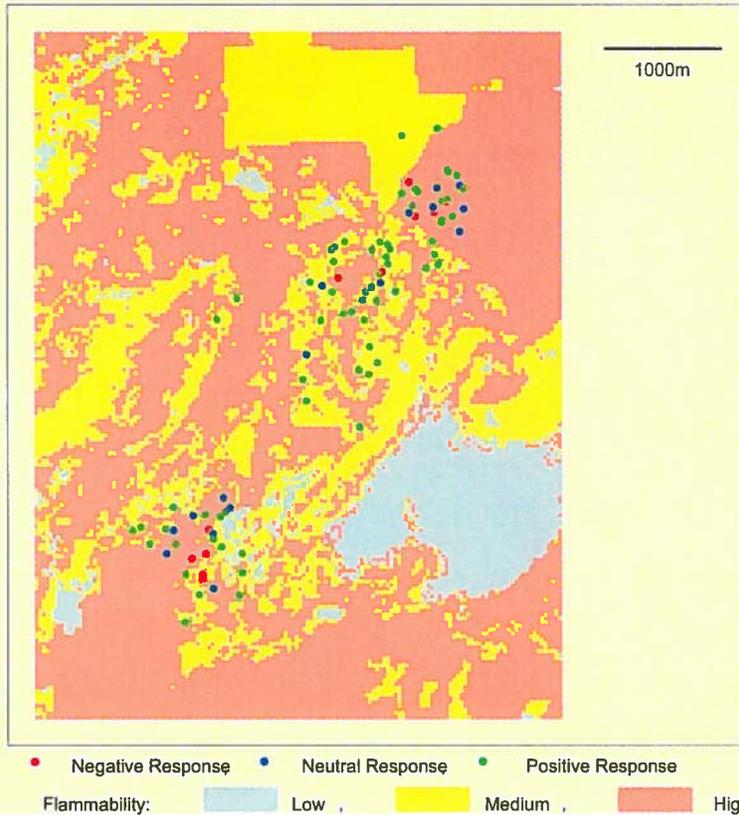
Approval of mechanical fuel reduction



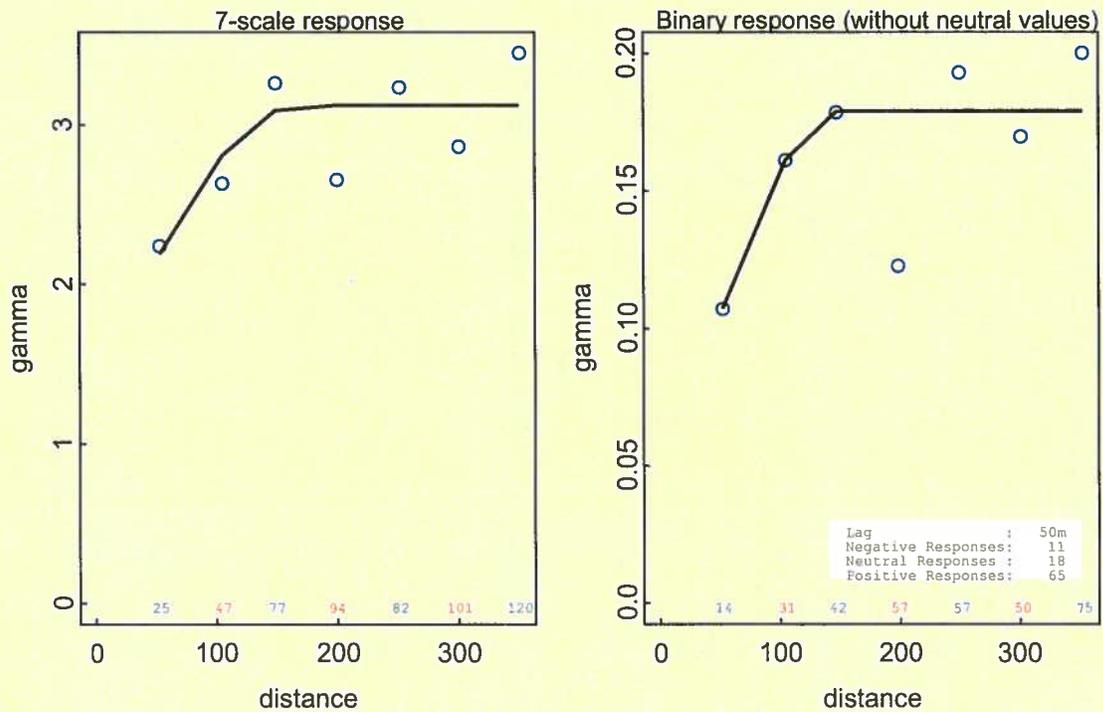
Approval of mechanical fuel reduction



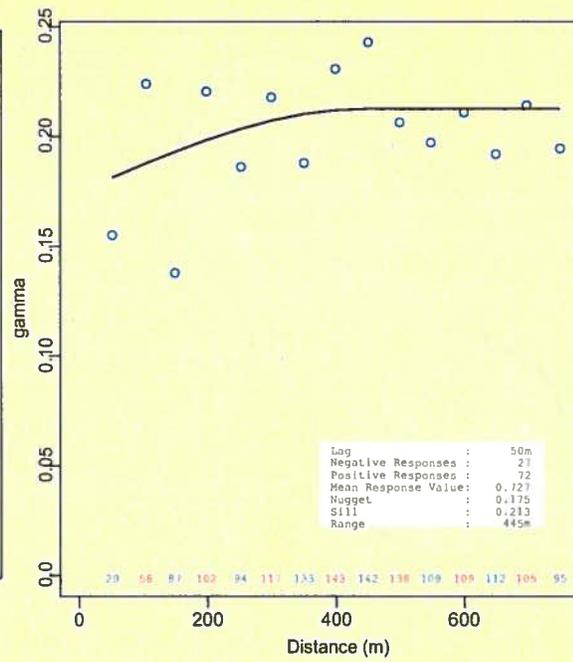
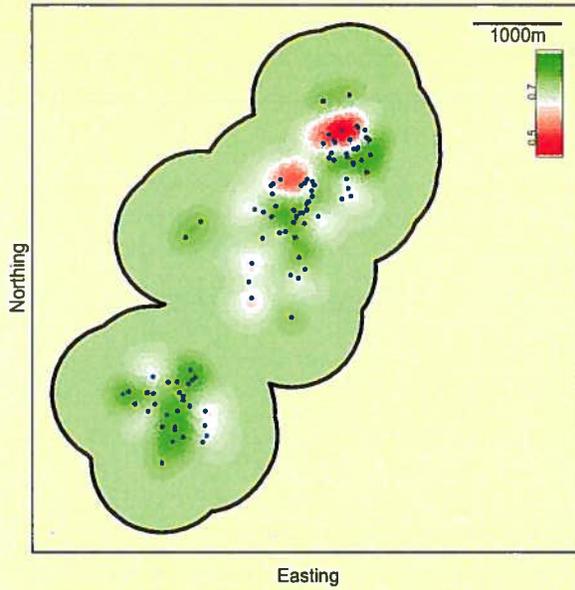
Approval of defensible space enforcement



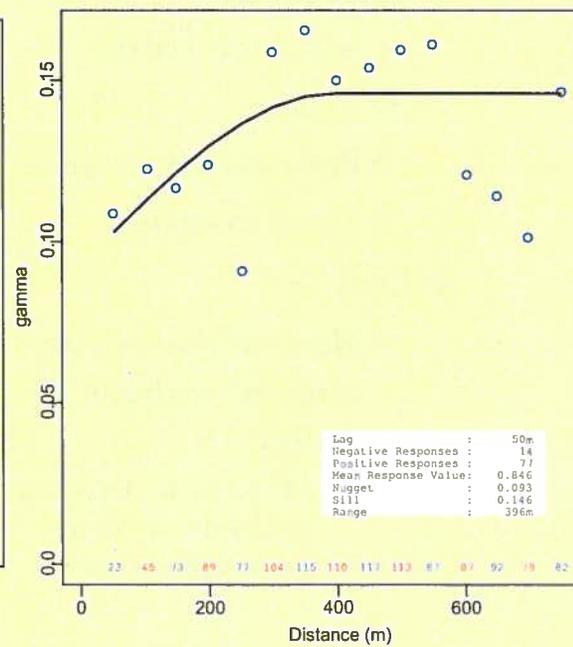
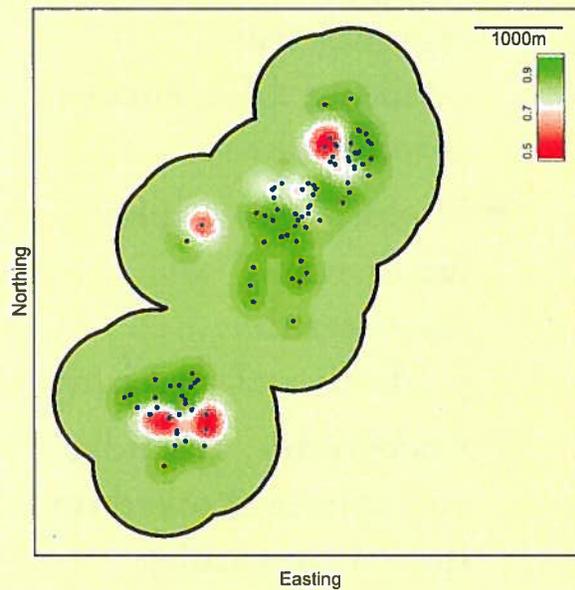
Approval of defensible space enforcement



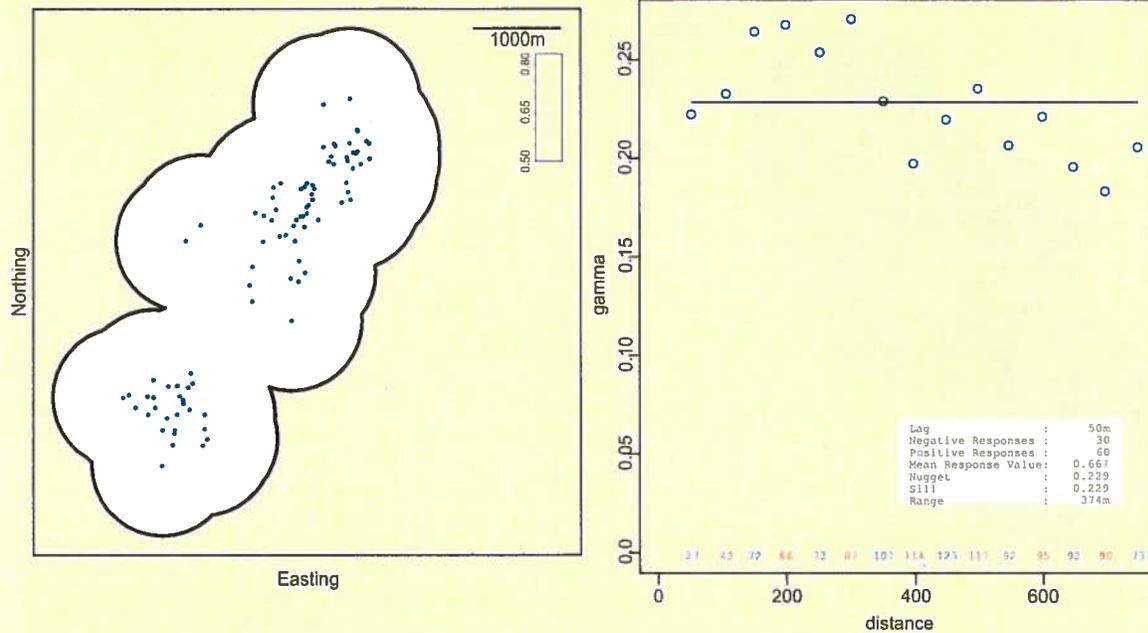
Prescribed burning referendum



Mechanical fuel reduction referendum



Defensible space enforcement referendum



So what relationships DID we find?

- ◆ Can predict acceptance from
 - ❖ Beliefs
 - ❖ Personal importance
 - ❖ Trust in agency
- ◆ But,
 - ❖ None of these easily assessed without survey, so,
 - Might as well ask what you really want to know (acceptance)
- ◆ Geography matters at regional scale (striking differences among states)
- ◆ No local geographic factor was consistently predictive of anything
- ◆ Acceptance, attitudes and beliefs showed no spatial continuity

Consistently predictive factors

- ◆ Prescribed burning
 - ❖ Personal importance
 - ❖ Cost effectiveness
 - ❖ Allows uncontrolled fires (negative)
 - ❖ Trust



Consistently predictive factors

- ◆ Mechanical treatment
 - ❖ Personal importance
 - ❖ Cost effectiveness
 - ❖ Impacts scenery (negative)
 - ❖ Trust
- ◆ Defensible space
 - ❖ Personal importance
 - ❖ Cost effectiveness
 - ❖ Impacts scenery (negative) (FL and MI)
 - ❖ Trust

Percent with fuel treatment experience

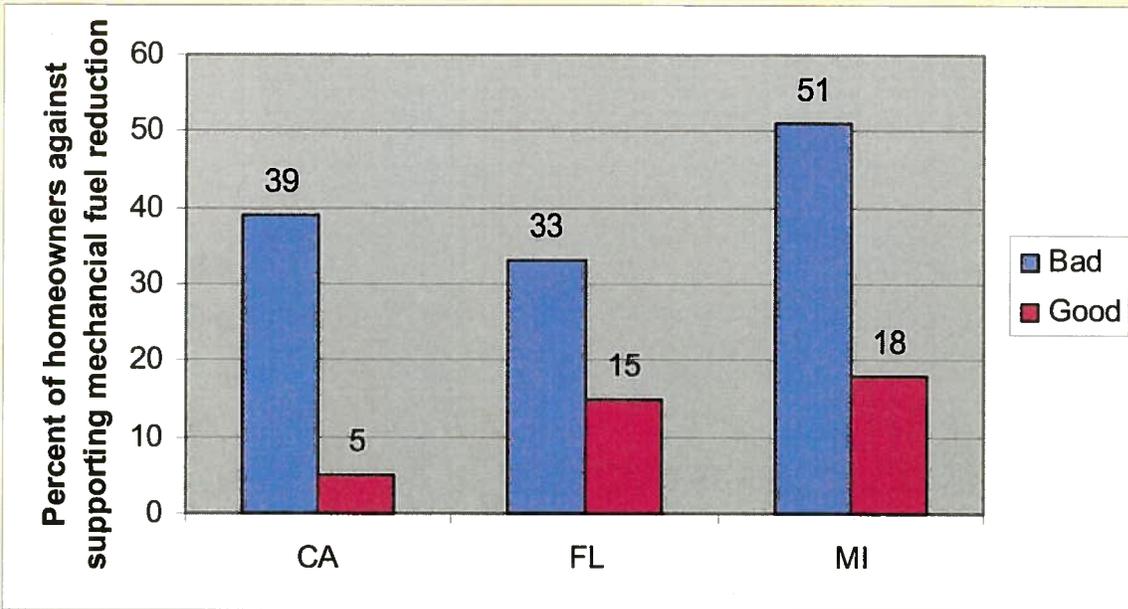
Over lifetime	Clay, FL	El Dorado/Placer, CA	Oscoda/Ogemaw/Crawford, MI
Prescribed burning near my home	31	25	21
Smoke discomfort from wildfires	61	68	17
Mechanical fuel reduction near home	5	21	9
Required to remove flammable vegetation on property	2	32	2
Actually removed flammable vegetation on property	44	91	42

Percent support, by treatment

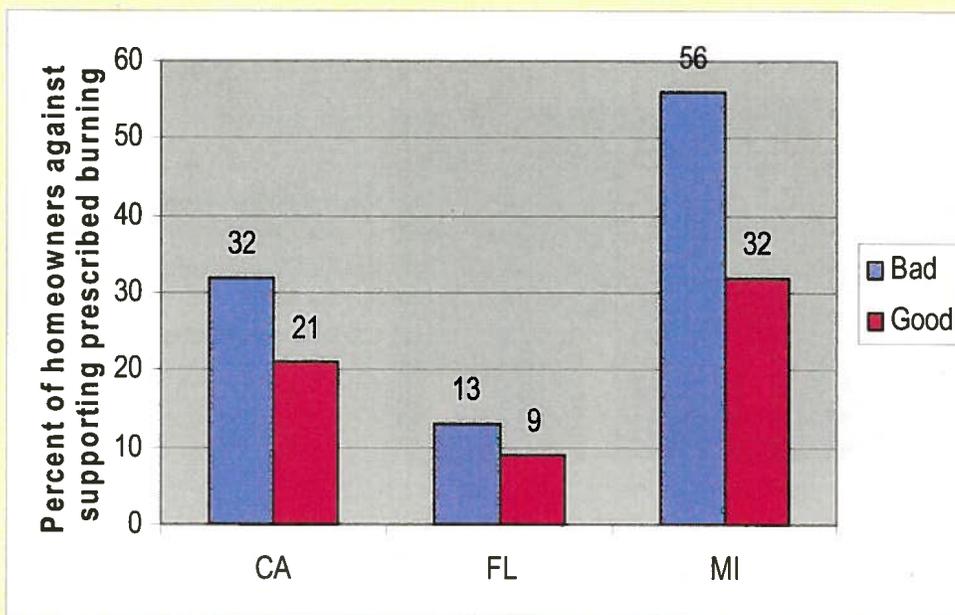
Data from 2145 valid surveys

	Florida	California	Michigan
Rx Fire	87	71	47
Mechanical	79	88	73
Def. Space	42	75	43
All three	32	49	18
1 or 2	96	99	86

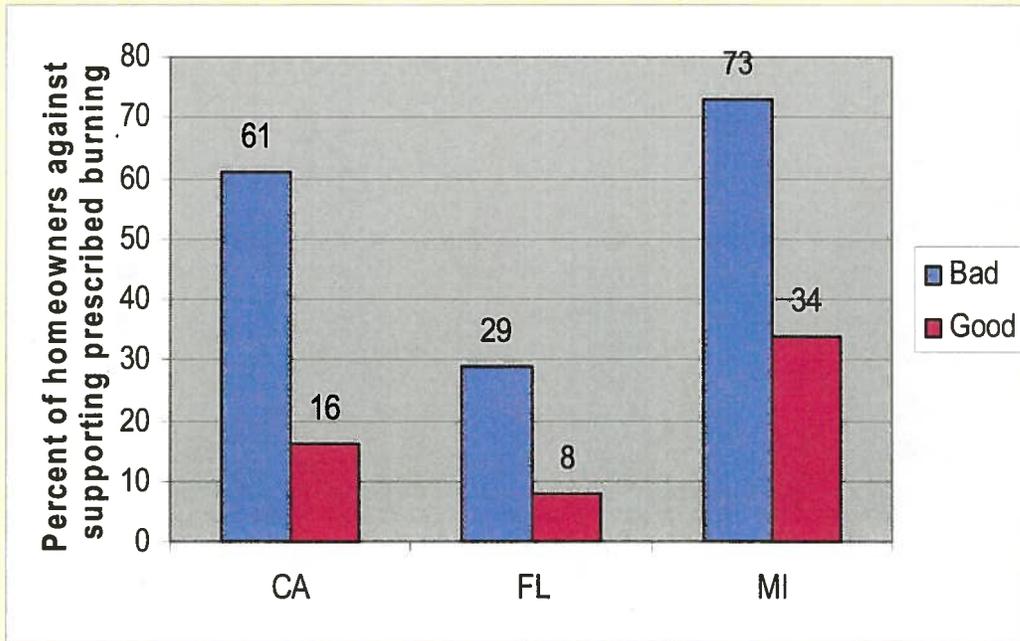
Belief that FMA extracts usable wood products is BAD or GOOD vs. non-support for mechanical fuel reduction



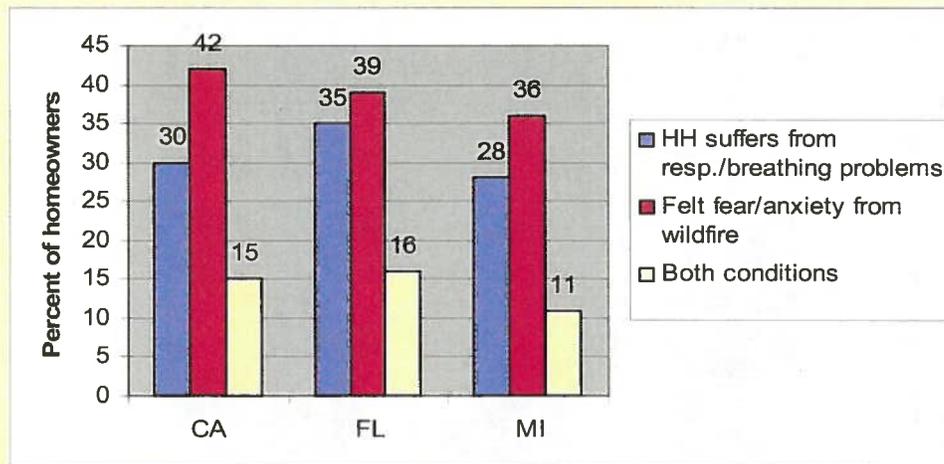
Belief that FMA could produce out-of-control fires is BAD or GOOD vs. non-support for prescribed burning



Belief that FMA creates more smoke in short-term/ less smoke over time is BAD or GOOD vs. non-support for Rx burning



Physical and mental health of WUI homeowners with respect to wildland fires and prescribed burning



You have to ask

- ◆ No shortcuts to predicting acceptance
- ◆ An abbreviated form of our tested survey can be used to assess acceptance and trust to target educational message
- ◆ There is no apparent advantage in geo-referencing survey responses, as they are unrelated to location

Mean trust on a 7-point scale

"I trust the gov't to..."	Clay, FL	El Dorado/Placer, CA	Oscoda/Ogemaw/Crawford, MI
...make proper use of prescribed burning	4.5	4.1	3.3
...notify public about prescribed burning	3.6	4.0	3.4
...make proper use of mechanical fuel reduction	4.1	4.2	3.5
...enact and enforce defensible space	3.6	3.9	3.0
...do a good job managing public land	4.1	3.9	3.5
...do a good job communicating about forest issues	3.7	3.6	3.0
...do a good job protecting private property from wildfires	4.9	5.2	3.9

They have to trust

- ◆ Trust in agency to manage fuels was predictive for all FMAs
- ◆ A spin-off case study was undertaken in Missouri with NC Station Fire Plan \$ to further examine the agency trust factor
 - ❖ An article summarizing these findings has been submitted to J. of Forestry

Products

- ◆ Web site (**www.fire-saft.net**)
 - ❖ Survey instrument
 - ❖ Project reports (2 posted, 1 in preparation)
 - ❖ Survey results summary
- ◆ Tech transfer article for fire managers
 - ❖ 1 in preparation
- ◆ Journal publications
 - ❖ 1 published, 2 submitted, 1 in preparation
- ◆ ISSRM proceedings article
- ◆ Formal presentations (9 to date)
- ◆ Spin-off grants (2 from North Central Station)

Project site: www.fire-saft.net

SAF-T



Home →

- Project Overview
- Study Sites
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- Products and Publications
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SAF-T Project Homepage

Social Acceptance of Fuel Treatments

As agencies plan fuel management activities, which involve public scoping, it would be helpful to know as much as possible about how well people understand agency objectives and the strategies designed to achieve them. Knowledge of the relationships between acceptance of fuel management strategies and understanding and perception of fuel management approaches, would allow strategic targeting of population subgroups for collaboration and outreach efforts. More easily estimated attributes of individuals, such as socio-demographic and home site geographical characteristics might also facilitate these efforts.



The **Fuel SAF-T** project combines the approaches and results of two ongoing studies: *Demographic and Geographic Approaches to Predicting Public Acceptance of Fuel Management at The Wildland-Urban Interface*¹ and *Predicting Public Acceptance of Fuel Management at the Lake States Forest Interface*². Our overall objective is to provide land managers with a standardized decision support tool that enables them to assess public acceptance and understanding of fuel treatments at the wildland urban interface (WUI).

¹Funding from the Joint Fire Science Program in cooperation with USFS Pacific Southwest Research Station and University of California Berkeley

²Funding from USFS North Central Research Station in cooperation with Michigan State University



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Any questions?



