

## ABSTRACT

Incorporating adaptive capacity into existing concepts of hazard vulnerability and resilience: what social characteristics lead to fire adapted human communities?

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The increasing threat and damages caused by wildfire in the United States has spurred the development of a number of policies and programs that encourage communities in the wildland urban interface (WUI) to reduce their vulnerability and increase their resilience. Efforts have been made to delineate and define WUI vulnerability using primary biophysical variables, but there has been little or no analysis of the interactions between demographic, structural and emergent elements of social context and their impact on community ability to adjust to the risk and reality of wildfire. We argue that current assessments of social vulnerability or resilience to hazards do not fully take into account the adaptive capacity of communities. For instance, they rarely recognize the impact of place-based knowledge/experience, interactions/relationships between local community members, structural/demographic characteristics, and macro-scale assessments of resources, not strong indicators of emergent community characteristics or social context that affect adaptive capacity. Our proposed research agenda would address this conundrum while at the same time contributing to theoretical discussions of hazard-resistant communities and the long-term sustainability of social-ecological systems. More specifically, we argue that emerging fire and hazard literature should further adapt and expand the concepts of adaptive capacity, resilience and vulnerability to the study of wildfire. It will help make sense of results derived from the wealth of recent case studies on efforts to reduce wildfire risk to human settlements. It will also provide new insights into the theoretical relationships between adaptive capacity, resilience and vulnerability by integrating critical elements of community social theory. We also argue that researchers need to better identify, quantify and describe the social characteristics of human communities important to such adaptive capacity relative to wildfire. We built from established theory and research in an effort to further define adaptive capacity as a critical element in the performance of hazard-resistant actions and the reduction of vulnerability to wildfire or other hazard events.

# INCORPORATING ADAPTIVE CAPACITY INTO EXISTING CONCEPTS OF HAZARD VULNERABILITY AND RESILIENCE

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# The “Fire Problem”(We all know the story)

- ◉ Nearly 100 years of fire exclusion
- ◉ Old growth “conversion” and other management actions
- ◉ Ownership fragmentation



# The “Fire Problem”

- ◉ 40 years of conflict over federal land management
- ◉ Climate change
- ◉ Explosion of development in the WUI



# Response to the “Fire Problem”

- ◉ Smokey
- ◉ Incident Command System
- ◉ Bigger, badder air-shows
- ◉ Bigger badder fire models



# More Recent Response

- ◉ National Fire Plan
- ◉ HFI
- ◉ HEFRA



# Meanwhile, back at the ranch

- ◉ Disinvestment
- ◉ Devolution
- ◉ Consolidation
- ◉ Congressional pressure
- ◉ Fire borrowing
- ◉ Conflicts over suppression efforts
- ◉ Suppression costs out of control

# Policy disconnect---

- ⦿ Human communities are threatened every fire season
- ⦿ Most resources are still going toward being reactive
- ⦿ The “problem” in the forest cannot be fixed in a short time frame
- ⦿ Immediate community protection has greater practical urgency

# Enter Social Science

- Good work published on public attitudes towards forests and fire
- Current on-going work on public attitudes toward smoke
- Foundational case study work on community response to fire events

# What is Lacking

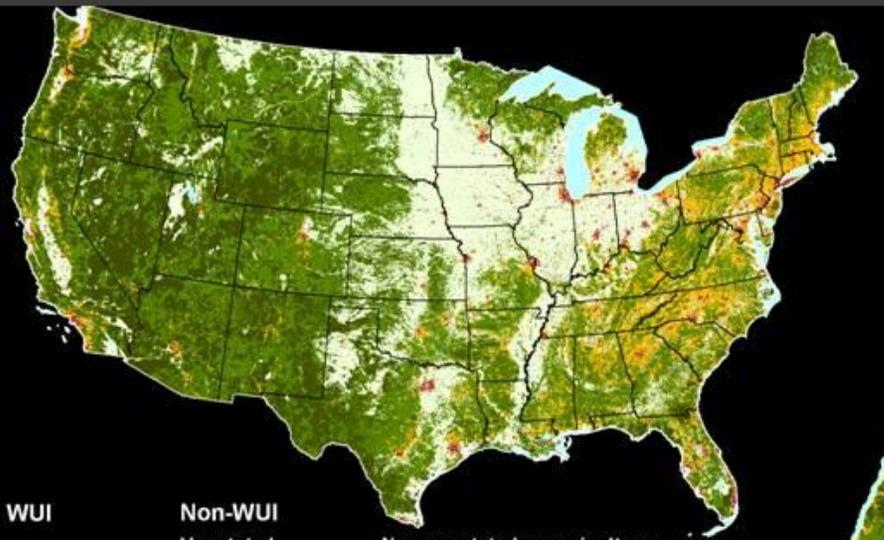
- Systematic understanding of what its going to take to make serious progress on the “fire problem” at the community level
- Focus needed on adaptability (action and potential for action) not just on attitudes, beliefs and willingness to pay

# What is also lacking

- Assessment tools for understanding what is needed in specific locales to improve fire adaptability and enhance safety



# The Wildland Urban Interface



## WUI

Intermix and interface

## Non-WUI

### Vegetated

Very low density housing

No housing

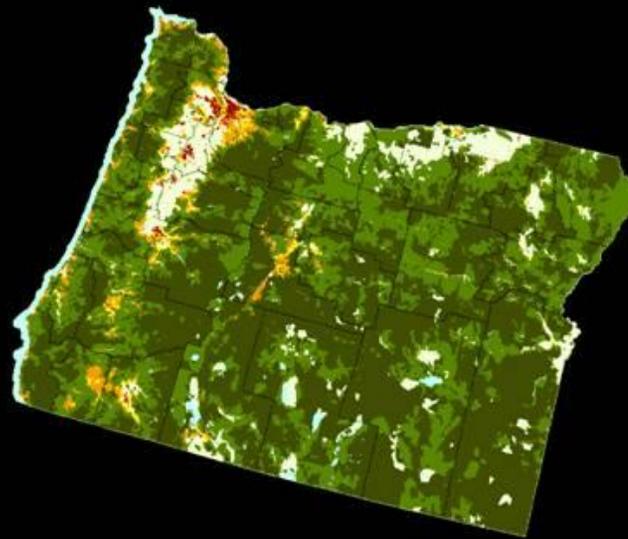
### Non-vegetated or agriculture

High and medium density housing

Low and very low density housing

Water

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## WUI

Intermix  
Interface

## Non-WUI

### Vegetated

Very Low Density Housing

No Housing

### Non-Vegetated or Agriculture

Medium and High Density Housing

Low and Very Low Density Housing

Water

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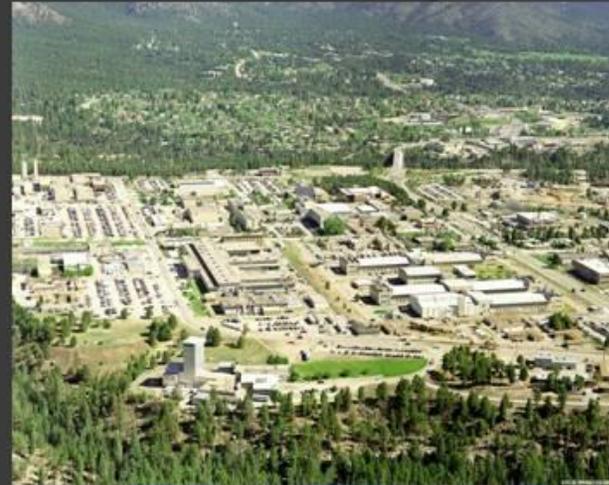
# Objectives

- Advance conceptual framework of social diversity in WUI
- Discuss development, application of framework
- Make the case for the development of assessment tools



# Social diversity and hazards

- Demographic indicators used to assess community vulnerability, resilience to hazards
- Need to understand less tangible qualities (social context) important to community action
- Both aspects necessary in ability of social systems/people to ADAPT prepare, or recover from changing hazards (i.e. fire)



# Adaptive capacity and resilience

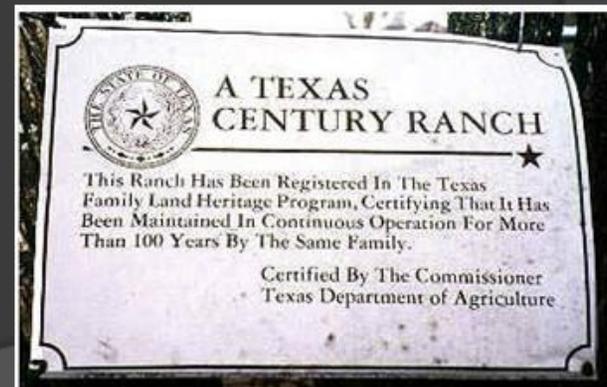
- Resilience: the “capacity of a system to absorb disturbance and reorganize during change to retain essentially the same function, structure and identity (Berkes 2007).”

# Adaptive capacity and resilience

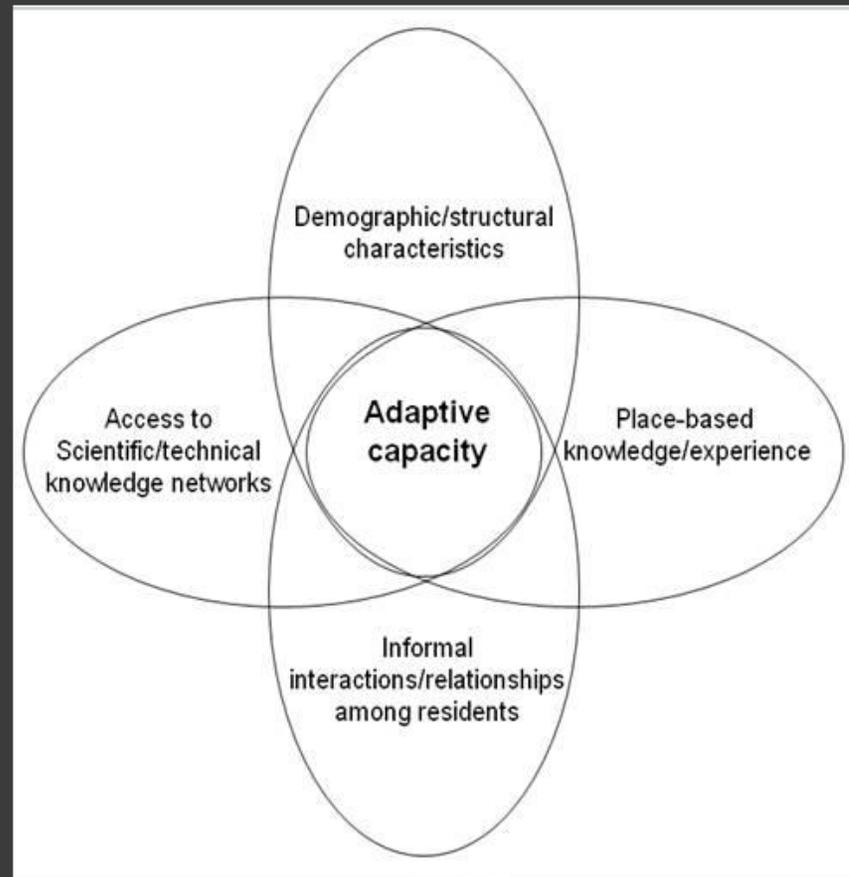
- Adaptive capacity: “ability of actors in a system to influence or manage resilience” (Walker and Meyers) through the collective mobilization of local resources (Folke et al 2002) or adaptation of a system experiencing stress (Parkins & MacKendrick 2007).

# Adaptive capacity

- Other studies stress mobilization of collective resources
- Intersection of material and social assets
- Importance of social context; local culture, knowledge and ability to solve problems
- Develop measures, determine origins of these characteristics



# Elements of adaptive capacity



# Theoretical perspectives

## ⦿ Interactional approach to community

- Social interaction critical in addressing problems
- Community as an evolving *process*



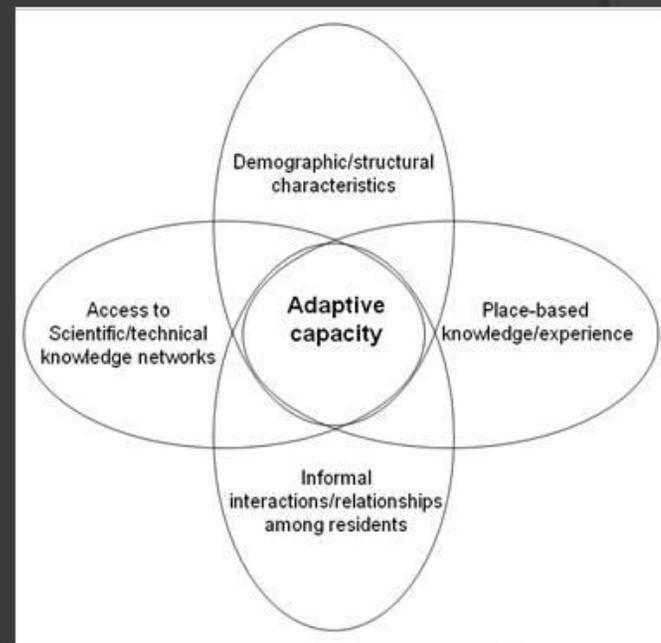
## ⦿ Place-based knowledge/experience

- Ties to local area/people
- Political and organizational capacity to adapt
- Knowledge of local fire history



# Adaptive capacity

- Perspectives consider demographic/structural characteristics AND social components
- Full-fledged understanding of community ACTION and availability of resources
- Multifaceted understanding of community variability, management needs



# Assessment Tool

- Combination of demographic and less structural, place-based elements
- Likely a rapid rural appraisal type application
- Designed for community self assessment and use by federal and state agencies for more effective distribution of resources

# Discussion

- The point: Diversity of social context important in assessing/attempting to increase community ability to ADAPT or prepare for fire hazards
- Communities achieved the same goal, but used different strategies
- Mobilization (or creation) of community resources leads to future management strengths/needs.



# Conclusion

- Research trajectory helps us understand how WUI communities are evolving differently in response to fire risk
- Begin to synthesize wealth of case study literature of fire adaptability
- Apply synthesis toward practical management strategies: systematic assessment of community safety needs that integrates regional and community variability

