

# Reducing Social Vulnerability and Enhancing Disaster Resilience

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US-Taiwan Workshop on Mega-City/Mega-Disaster Reduction

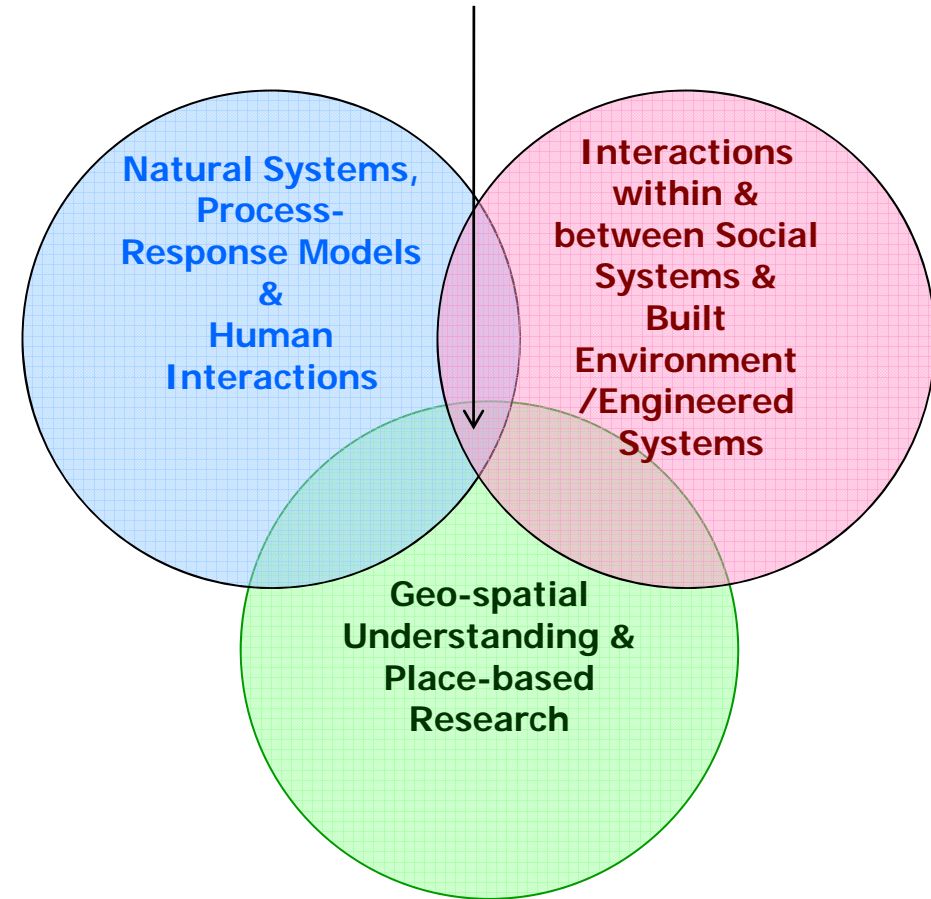
Taipei, Taiwan

May 6-7, 2010



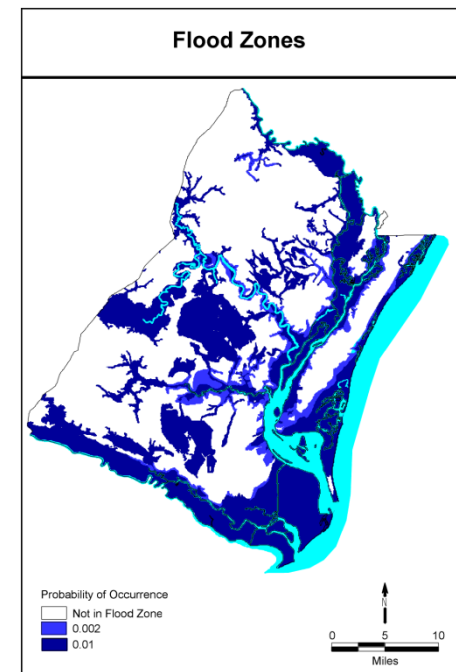
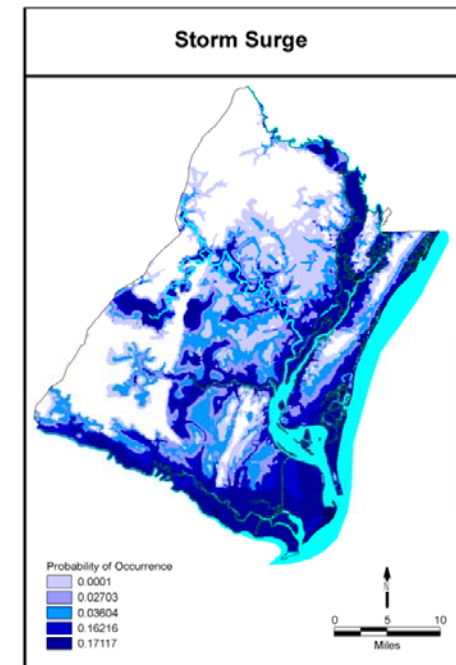
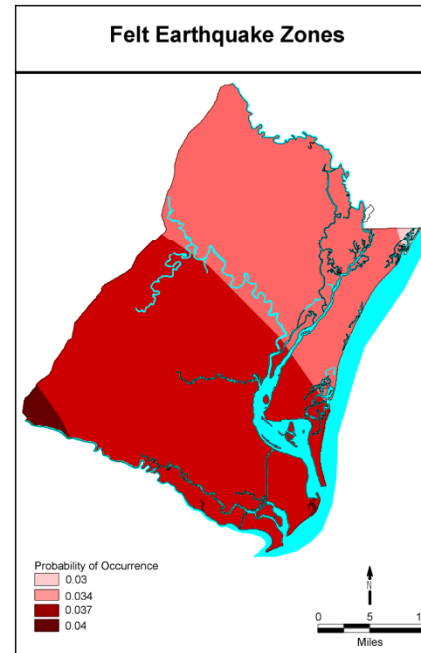
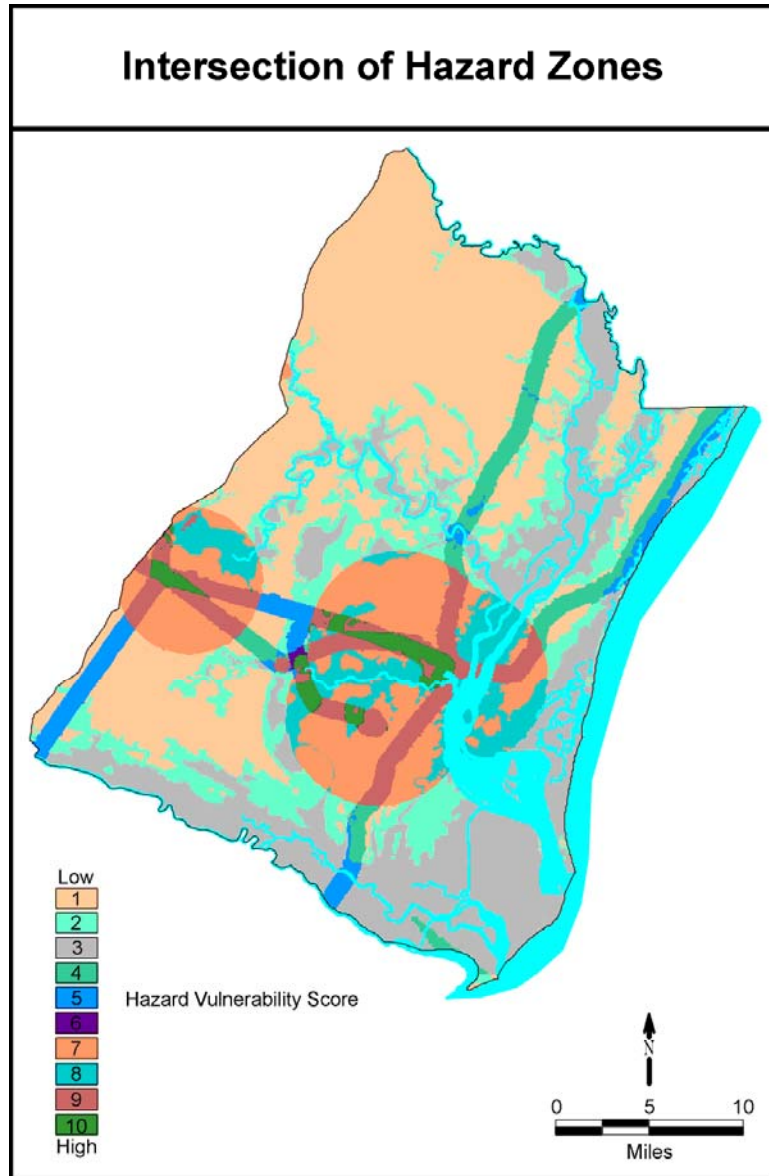
# Vulnerability and Resilience Science

- What circumstances place people and localities at risk?
- What enhances or reduces the ability to respond to and recover from environmental threats?
- What are the geographic patterns between and among places?



Goal: Provide scientific basis for disaster and hazard reduction policies through the development of methods and metrics for analyzing societal vulnerability and resilience to environmental hazards and extreme events

# Spatial Assessments of Vulnerability

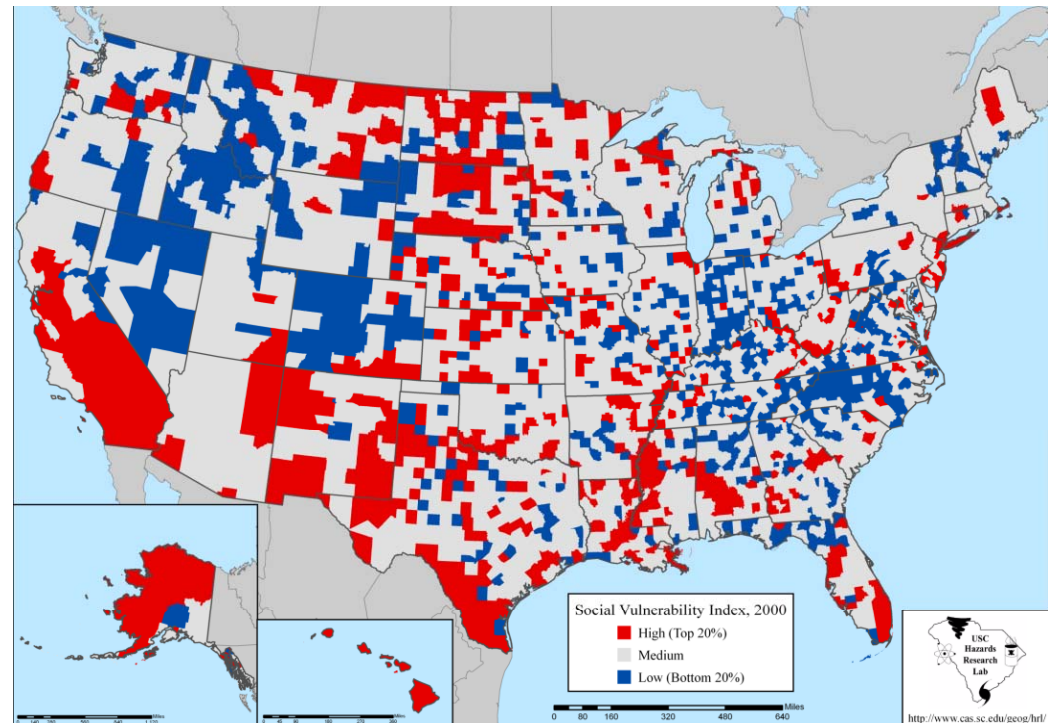




# Social vulnerability mapping

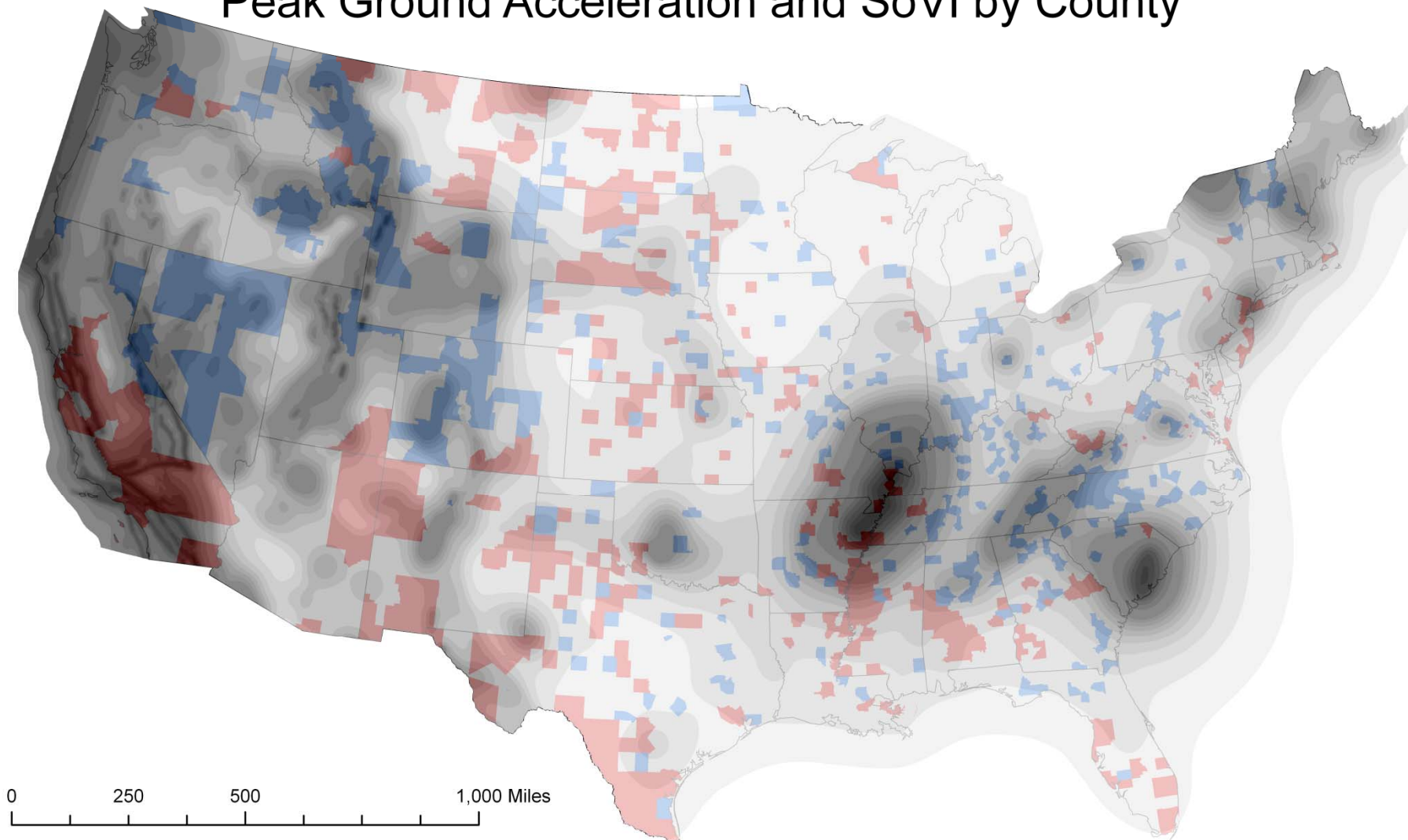
- Identification of population characteristics that influence the social burdens of risks
- How those factors affect the distribution of risks and losses

Based on extensive post-disaster field work monitoring the location of losses including surveys of affected populations as well as pre-impact studies; draws from social indicators & health disparities research





# Peak Ground Acceleration and SoVI by County



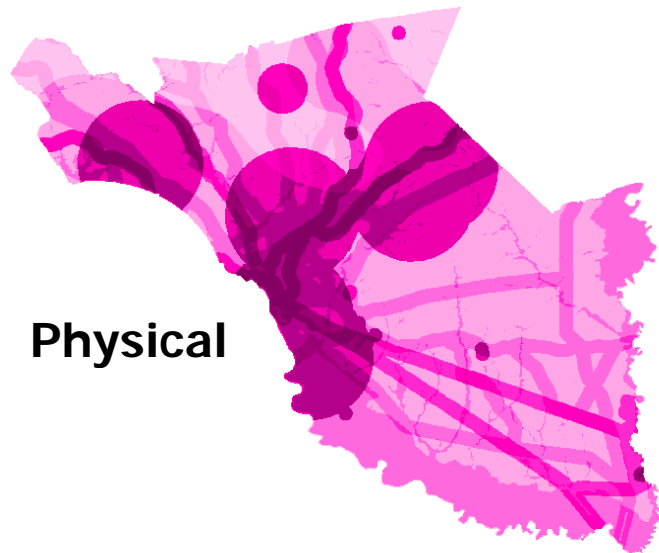
## Social Vulnerability

- High
- Average
- Low

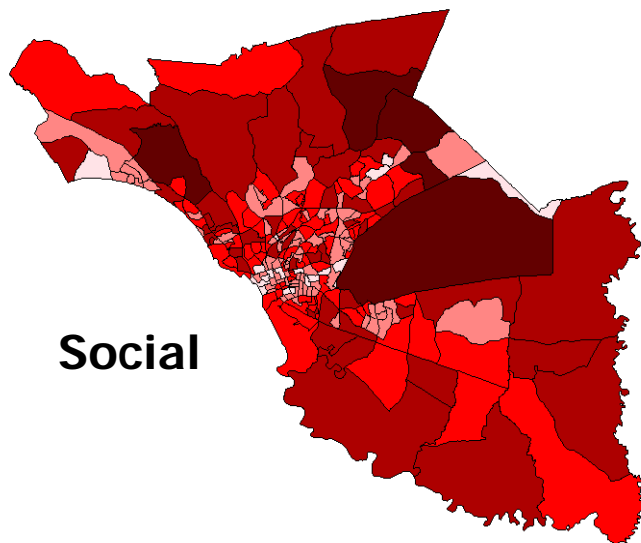
## Peak Ground Acceleration (%g)

- |       |         |         |         |         |           |
|-------|---------|---------|---------|---------|-----------|
| 0 - 1 | 6 - 7   | 12 - 13 | 18 - 19 | 40 - 49 | 80 - 119  |
| 2 - 3 | 8 - 9   | 14 - 15 | 20 - 29 | 50 - 59 | 120 - 159 |
| 4 - 5 | 10 - 11 | 16 - 17 | 30 - 39 | 60 - 79 | 160       |

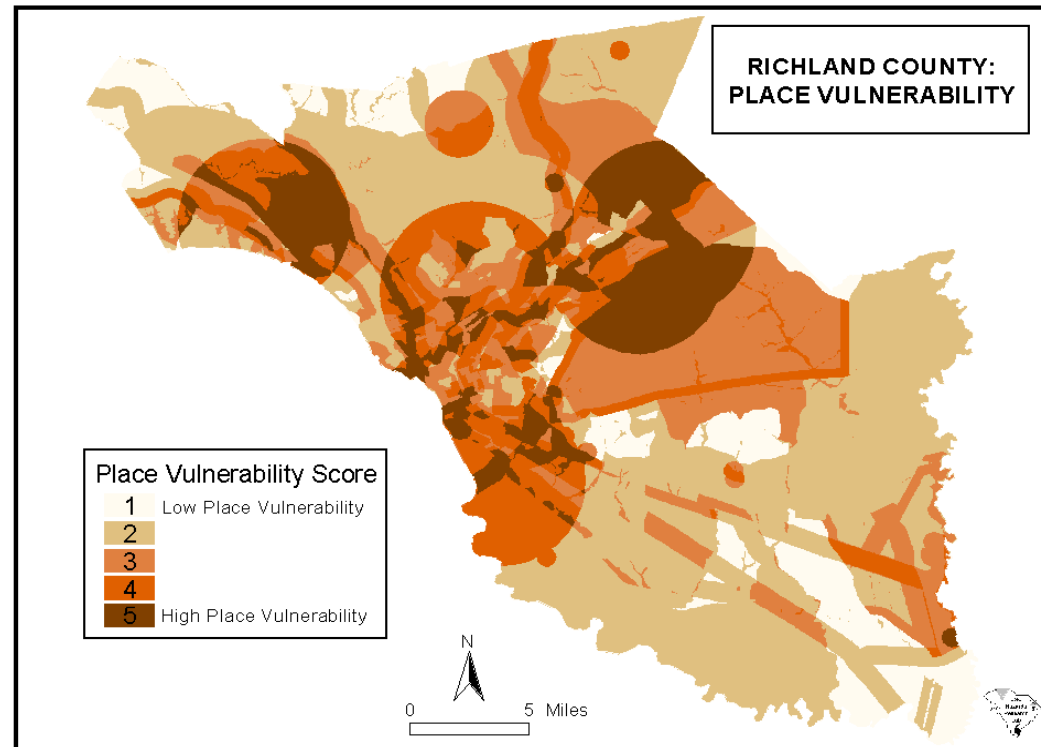
# Multi-Hazard Vulnerability Assessments



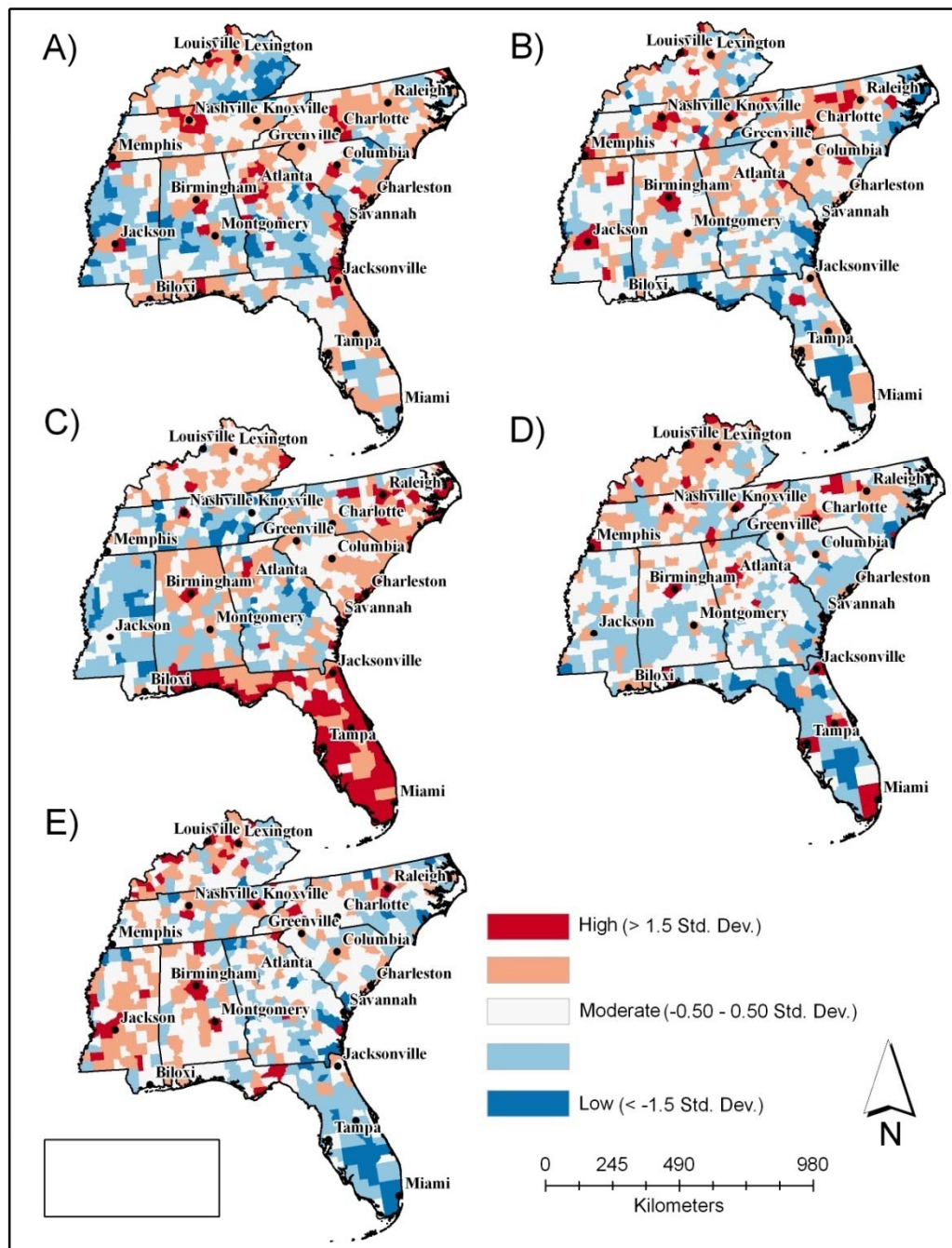
**Physical**



**Social**



Cutter, S.L., J.T. Mitchell, and M.S. Scott, 2000. "Revealing the Vulnerability of People and Places: A Case Study of Georgetown County, South Carolina," *Annals of the AAG* 90 (4): 713-737.



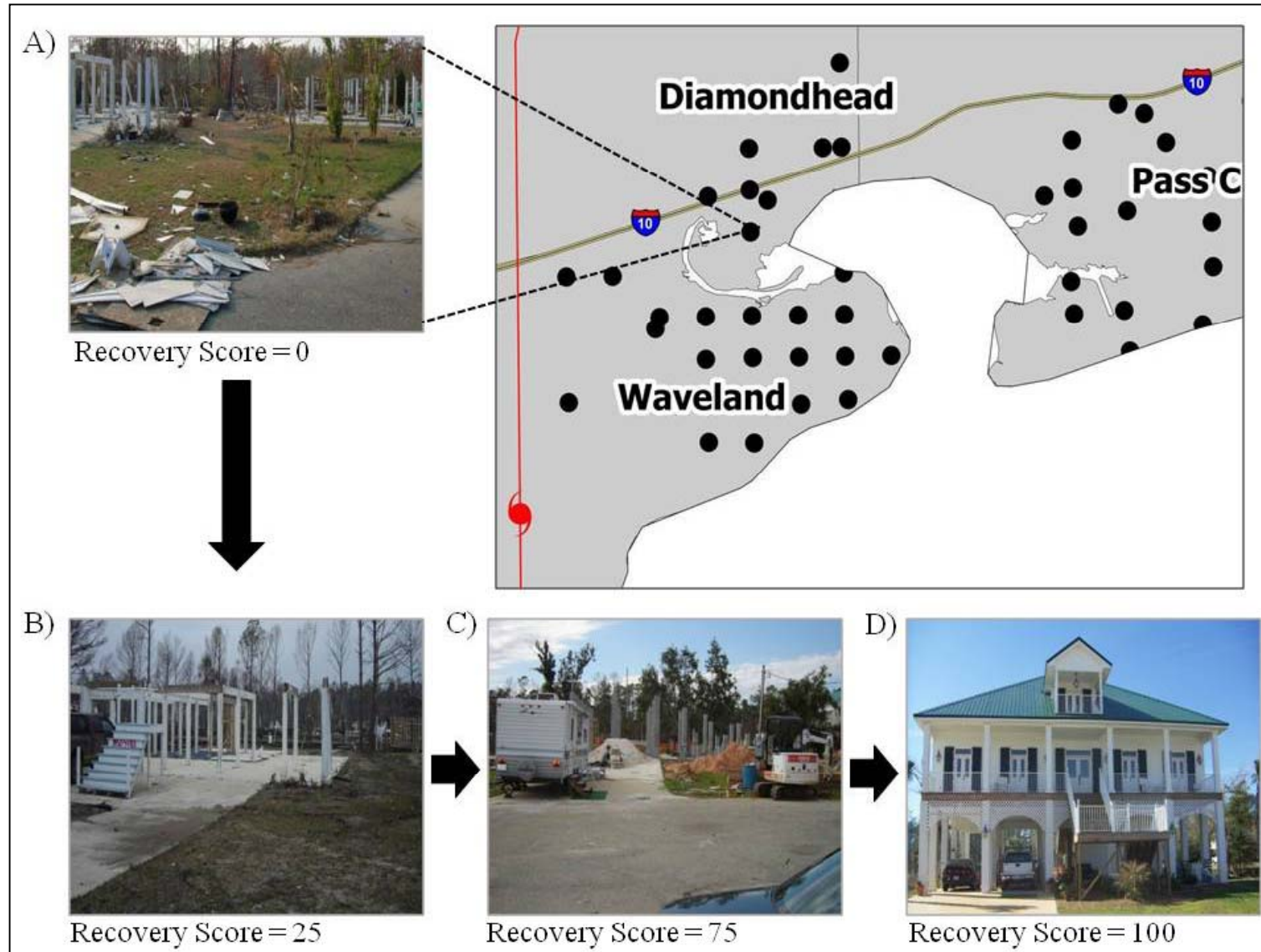
# Pre-Event Planning: Baseline indicators of disaster resilience

- A. Social: education, age, special needs...
- B. Economic: employment, homeowners, single sector
- C. Institutional: mitigation, disaster experience, emergency services
- D. Infrastructure: roads, bridges, schools, hospital beds
- E. Community capital: long-term residents, religious adherents

Cutter, Burton, and Emrich, 2010. Disaster resilience indicators for benchmarking baseline conditions, *Journal of Homeland Security and Emergency Management*, under review.



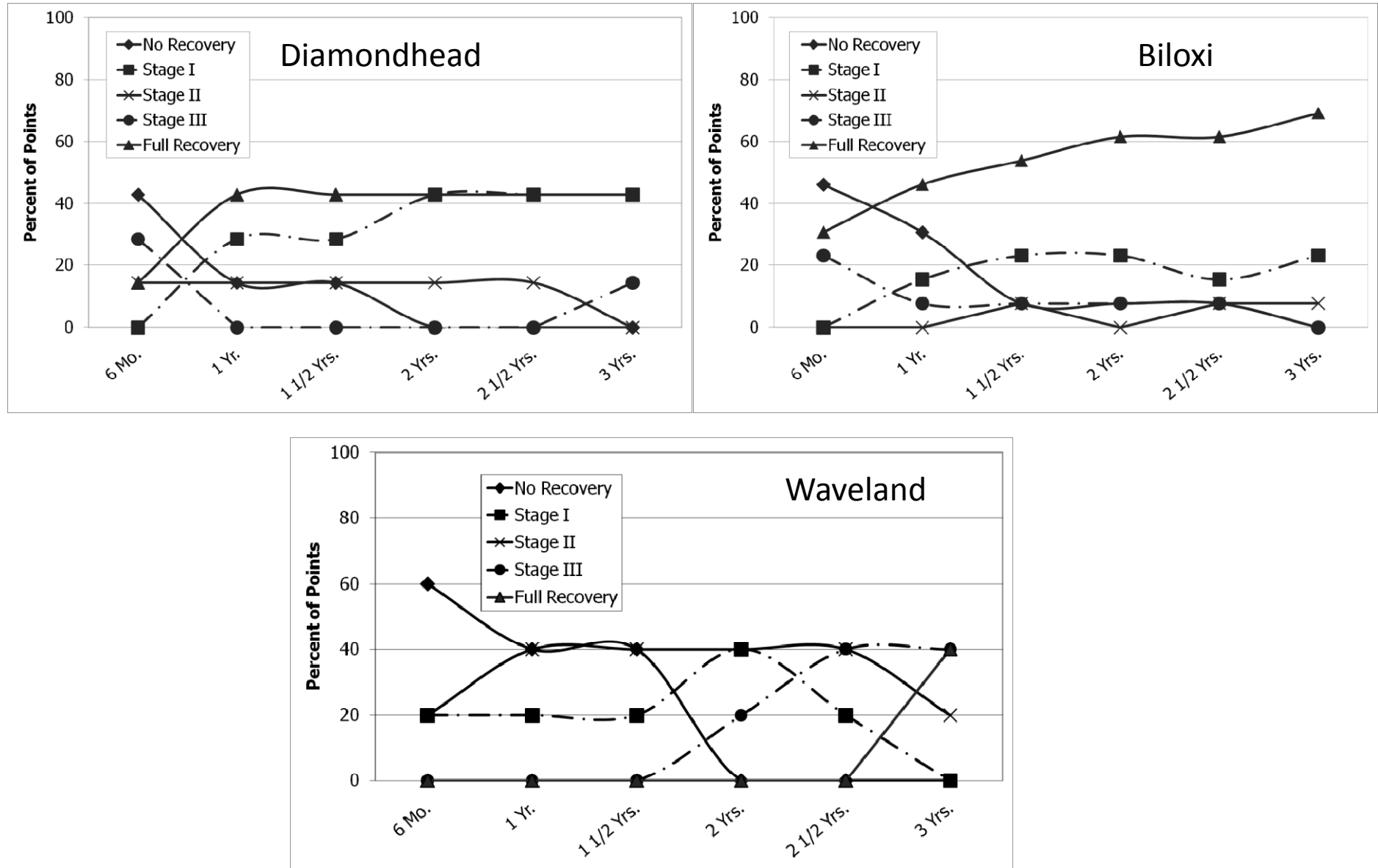
# Post Event: Spatial Monitoring of Recovery

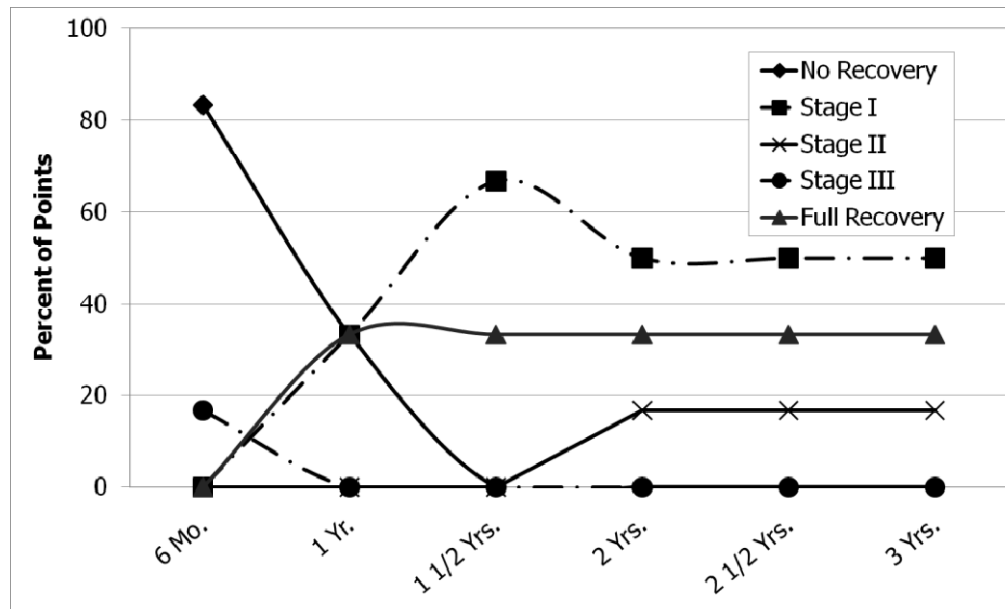


Burton, C., J. T. Mitchell, S. L. Cutter, 2010. Evaluating post-Katrina recovery in Mississippi with repeat photography, *Disasters*: forthcoming.

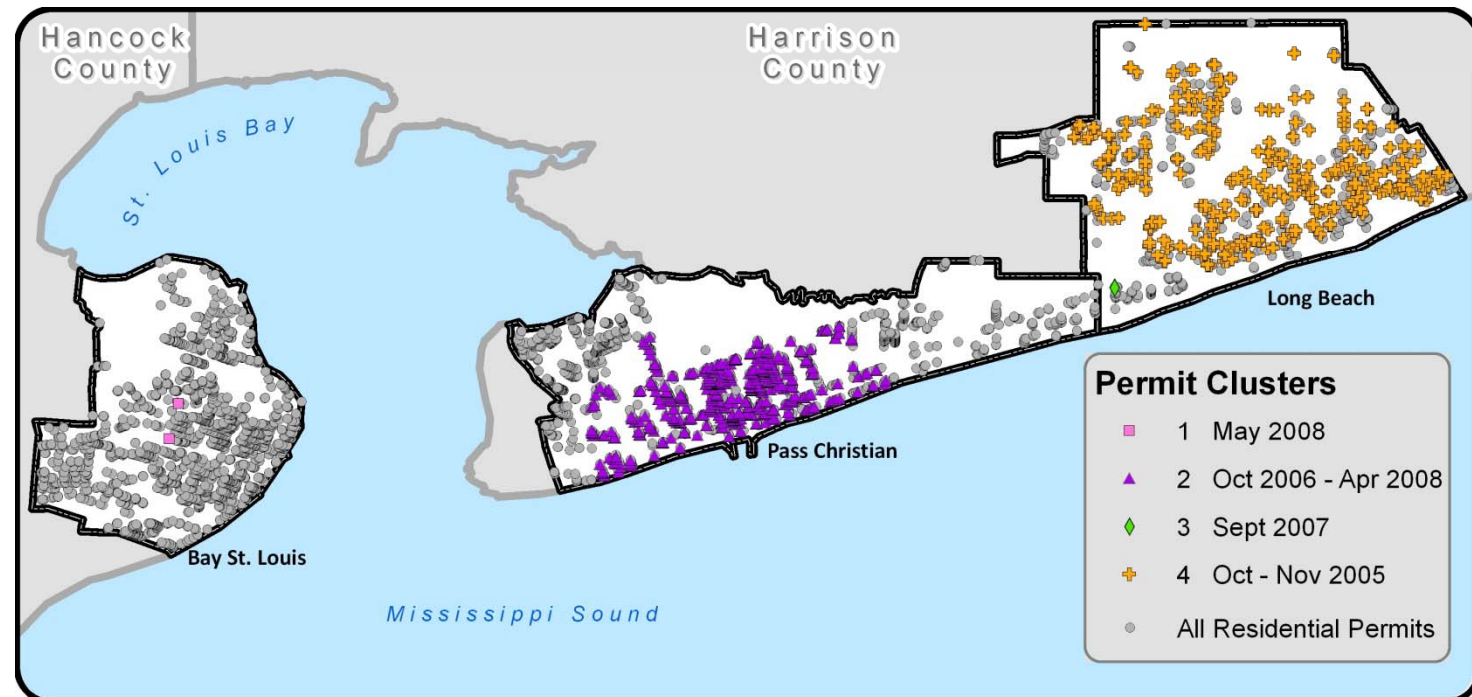


# The Recovery Divide in Coastal Mississippi





## Pass Christian



Stevenson, J. R., C. T. Emrich, J. T. Mitchell, and S. L. Cutter, 2010. Using building permits to monitor disaster recovery: a spatio-temporal case study of coastal Mississippi following Hurricane Katrina, *Cartography and Geographic Information Science* 37 (1): 57-68.