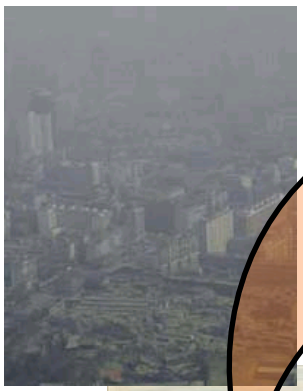
Explaining Local Commitment to Climate Change Policy in the United States

Samuel D. Brody

Sammy Zahran, Himanshu Grover, Arnold Vedlitz

Environmental Planning and Sustainability Research Unit
Hazard Reduction and Recovery Center
Department of Landscape Architecture and Urban Planning
Texas A & M University

Role of Local Jurisdictions



Primary Contribution

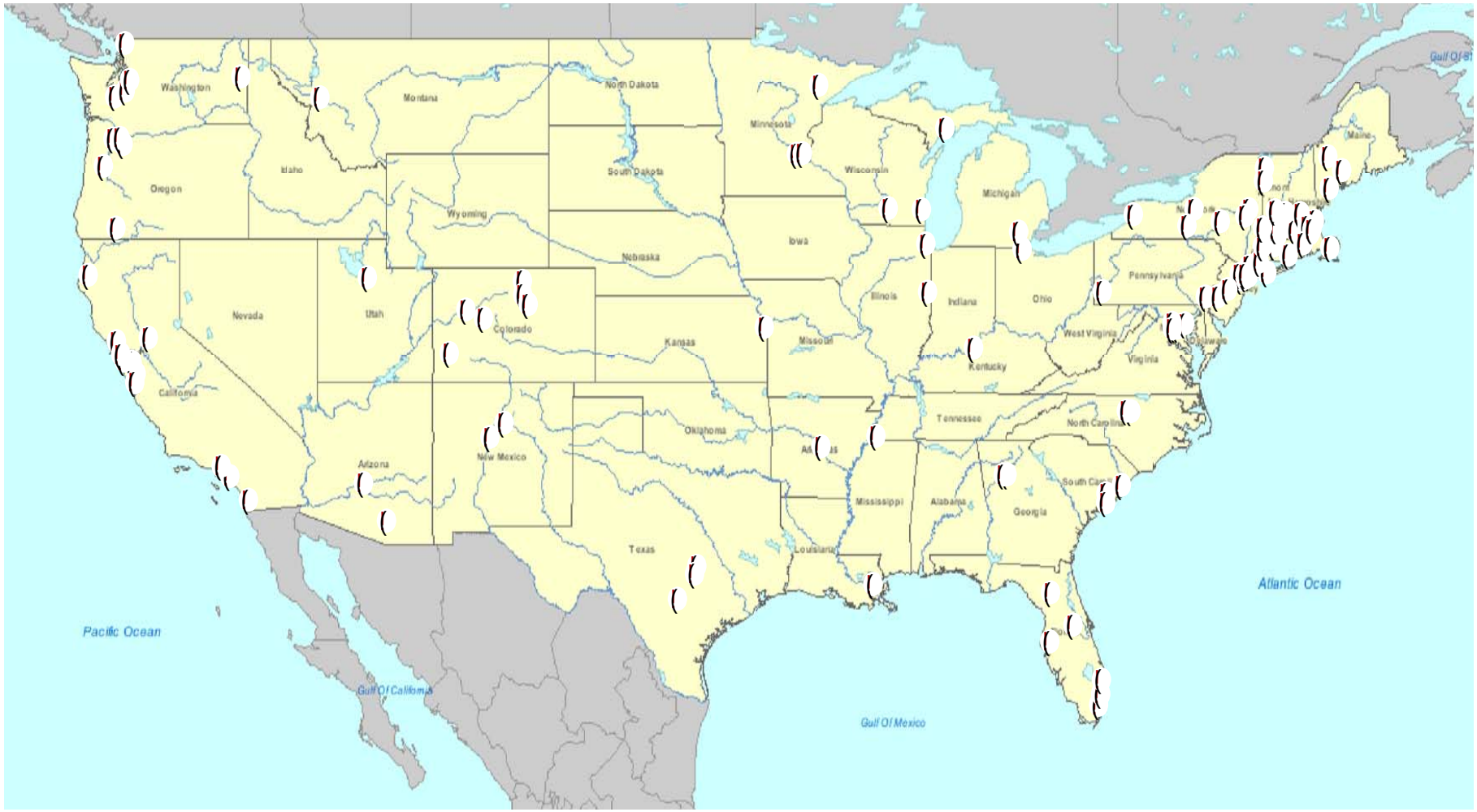
Noticeable Impact

Internet sources of Photographs : http://tiki.oneworld.net; http://www.foe.co.uk; http://www.oxfam.org.uk ; http://news.bbc.co.uk ; http://www.asahi.com ; http://www.ucar.edu

Cities for Climate Protection

- 1993 “Toronto Target
- International Council for Local Environmental Initiatives (ICLEI) coordinates mitigation efforts of 675 municipalities globally
- 100+ U.S. localities joined the Cities for Climate Protection (CCP)
- Localities recognize climate change as significant local concern, and commit to reduction of local GHG emissions

Counties Party to the CCP Campaign (November 2005)



Four Reasons Not to Join CCP

- Reducing local emissions will not fully insulate a locality from the adverse transboundary effects
- The costs of climate change mitigation may be greater than the expected benefits
- The collective benefits of climate protection are non-excludable
- No federal mandate or assistance for the implementation of climate change protection programs

Why would a U.S. locality commit to the CCP campaign when there are strong incentives to do otherwise?

Place as a Source of Selective Incentives

Selective incentives to participate in the CCP campaign spring from two major sources:

1) The extent to which a locality is vulnerable to the risks of climate change and variability

2) The socioeconomic capacity of a locality to commit to emission reduction targets

Climate Change Risk Incentives

- Coastal proximity and water risk
- Expected temperature change
- Extreme weather events

All things held equal, localities with higher vulnerability to the risks of climate change are significantly more likely to commit to the CCP

Socioeconomic Capacity Incentives

- Carbon intensive activities and industries
- Political and civic composition
- Environmental concern

All things held equal, localities with higher socioeconomic capacity are significantly more likely to commit to the CCP

Research Questions

- What is the spatial distribution of risk to climate change across the U.S.?
- What is the spatial distribution of socioeconomic capacity to adopt climate change policies across the U.S.?
- What are the geographic and socioeconomic factors influencing local jurisdictions in the U.S. to adopt climate change reduction policies?

Research Objectives

- Calculate and map vulnerability and socioeconomic capacity for all counties in the U.S.
- Explain adoption of the CCP using logistic regression analysis
- Identify recruitment opportunities for CCP adoption using dimensional analysis of risk and socioeconomic capacity

Predictor Variables

Climate Change Risk Variables

- Natural Hazards Casualties
- Temperature Change
- Coastal County

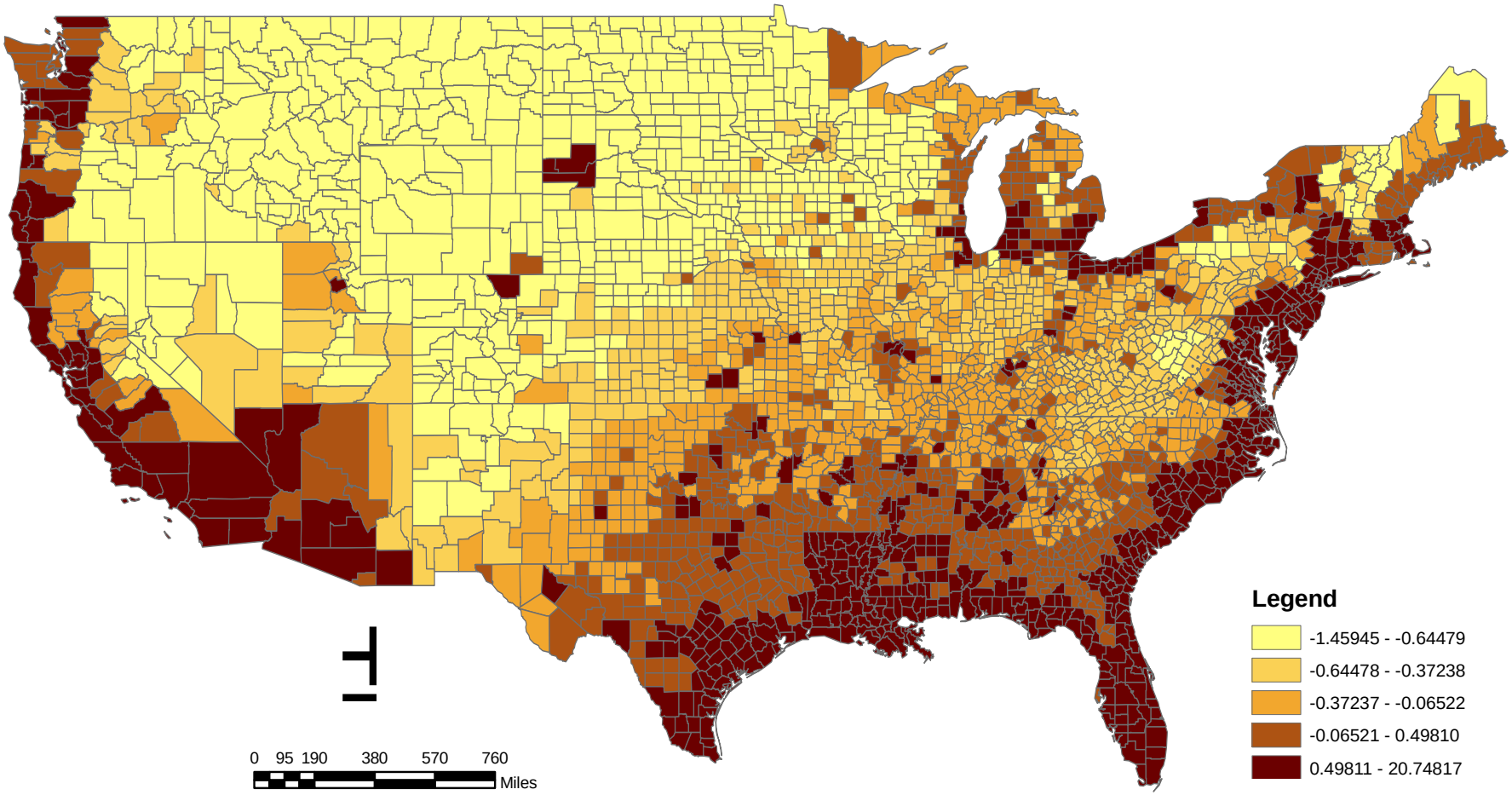
Socioeconomic Variables

- Net Percent Democrat
- Percent Recycled
- Non-Profit Environmental Groups
- HAP Emissions Per Capita
- Percent Carbon Employment

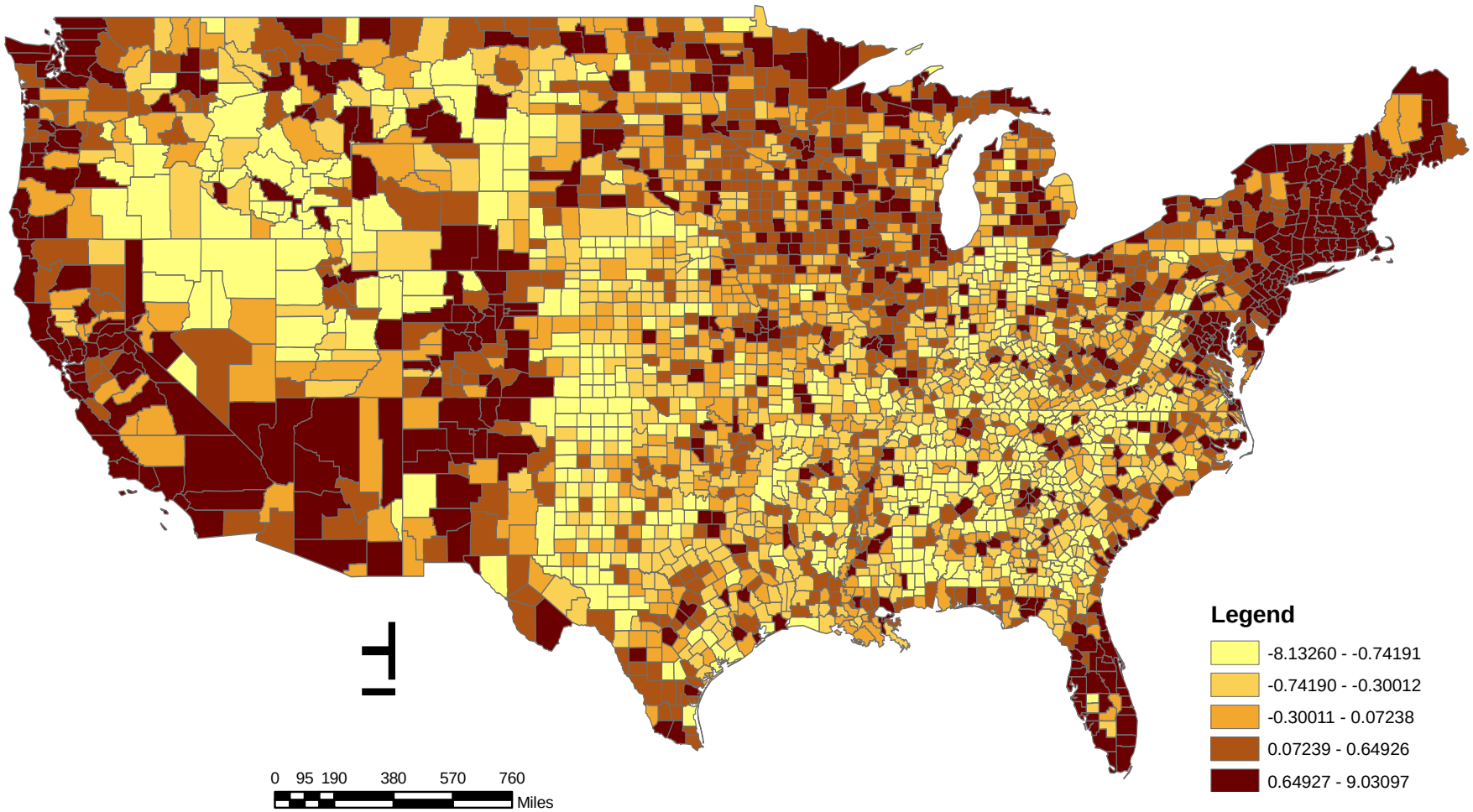
Control Variables

- Percent Urban
- Percent College Educated

Geography of Climate Change Risk



Geography of Socio-economic Capacity



Factors Influencing CCP Adoption

Climate Change Risk Variables

- Natural Hazards Casualties
- Temperature Change
- Coastal County

Socioeconomic Variables

- Net Percent Democrat
- Percent Recycled
- Non-Profit Environmental Groups
- HAP Emissions Per Capita
- Percent Carbon Employment (-)

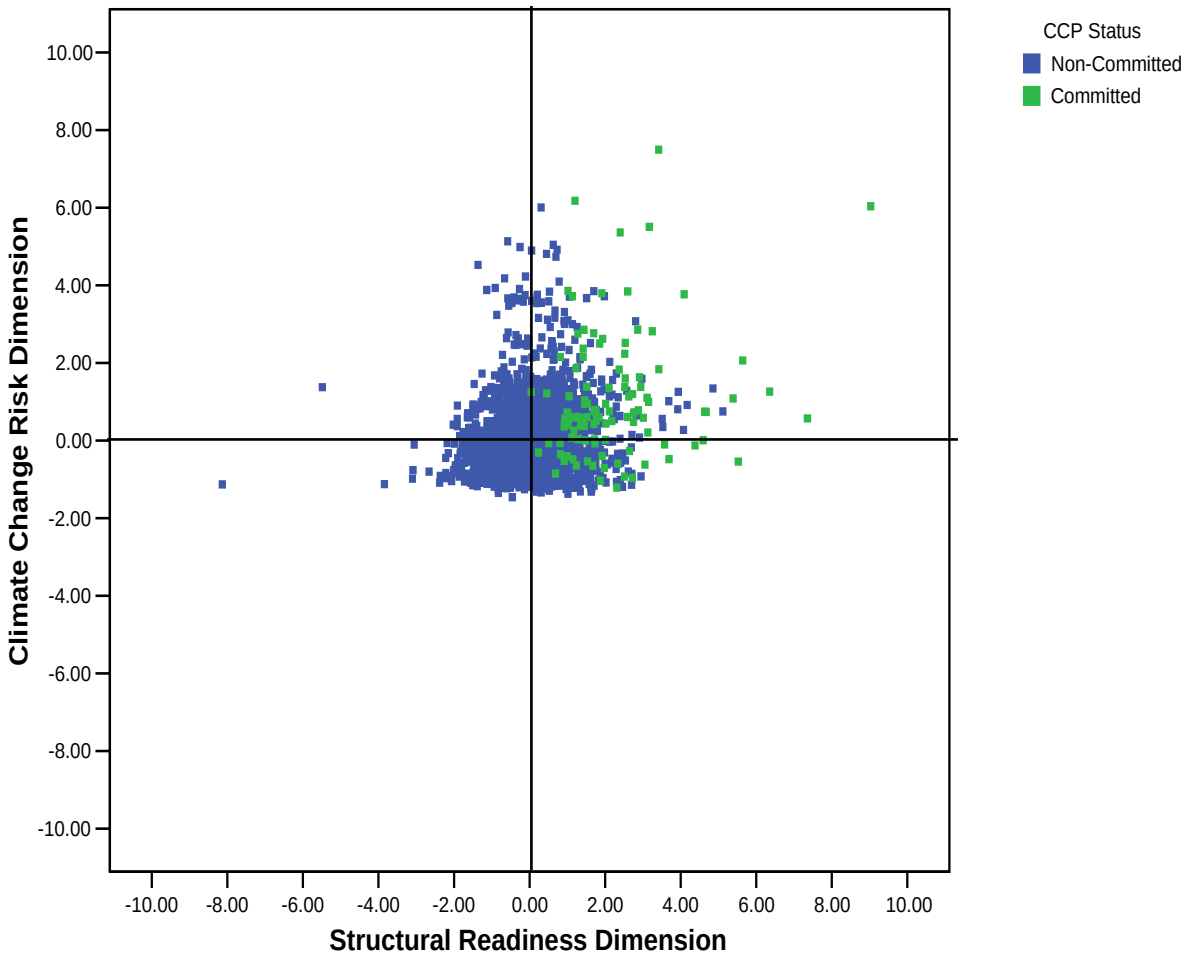
Control Variables

- Percent Urban
- Percent College Educated

Factors Influencing CCP Adoption

	B	Exp (B)	B	Exp (B)	B	Exp (B)
Climate Change Risk Variable						
Natural Hazards Casualties	.526** (.323)	1.692	.472** (.095)	1.604	.363** (.103)	1.437
Temperature Change	.482** (.081)	1.620	.183* (.110)	1.201	.232** (.111)	1.261
Coastal County	2.10** (.226)	8.163	.661** (.267)	1.936	.597** (.289)	1.817
Socioeconomic Variables						
Net Percent Democrat			.058** (.007)	1.060	.053** (.007)	1.054
Percent Recycled			.162** (.032)	1.175	.089** (.044)	1.093
Non-Profit Environmental Groups			.745** (.231)	2.106	.743** (.230)	2.102
HAP Emissions Per Capita			-.004 (.004)	.996	-.002 (.003)	.998
Percent Carbon Employment			-.095** (.021)	.910	-.045* (.027)	.956
Control Variables						
Percent Urban					.018** (.007)	1.019
Percent College Educated					.043** (.021)	1.044
Constant	-5.570** (.323)	.004	-7.318** (1.468)	.001	-8.401** (1.660)	.000
Nagelkerke R-Squared Model Chi-Square -2 Log likelihood N	.231 195.818 759.211 3071		.571 446.802 508.228 3071		.585 521.928 433.101 3071	

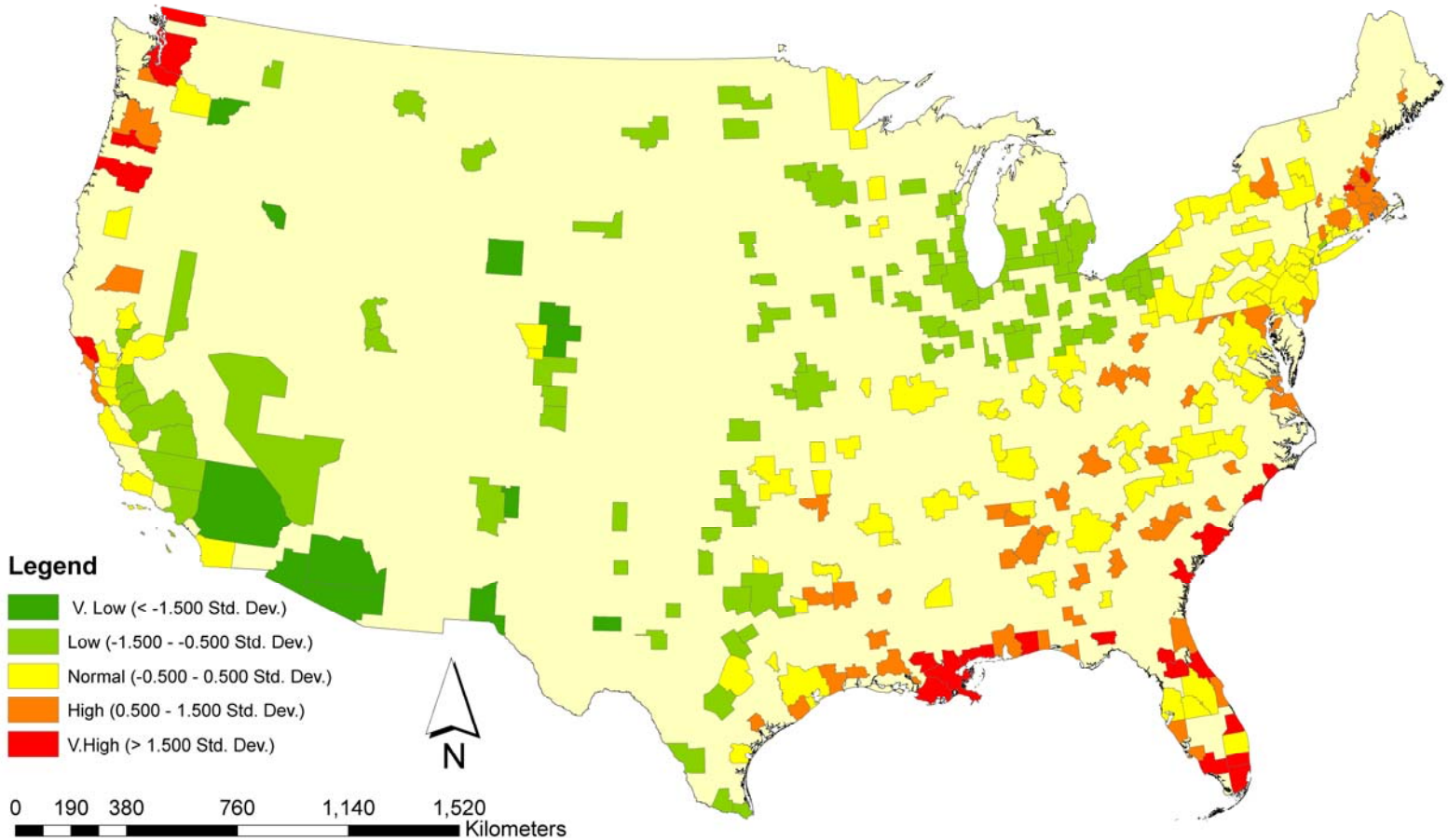
Scatter Plot of Risk and Capacity by CCP Status



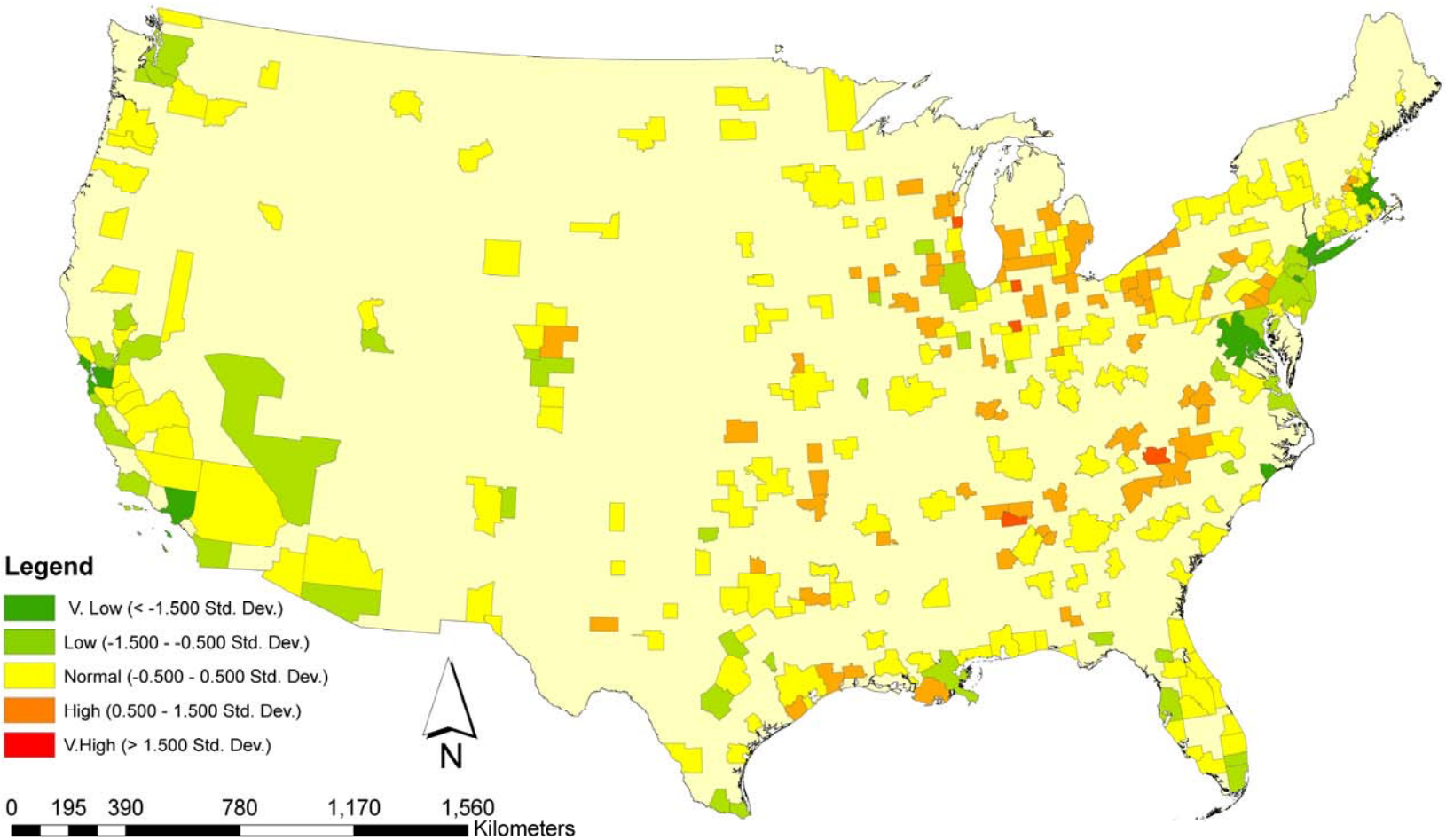
Conclusions

- Decisions makers sensitive to physical risks of climate change
- Socioeconomic make-up of a jurisdiction is a primary motivator
- CCP Recruitment opportunity: High-High quadrant as “low hanging fruit”

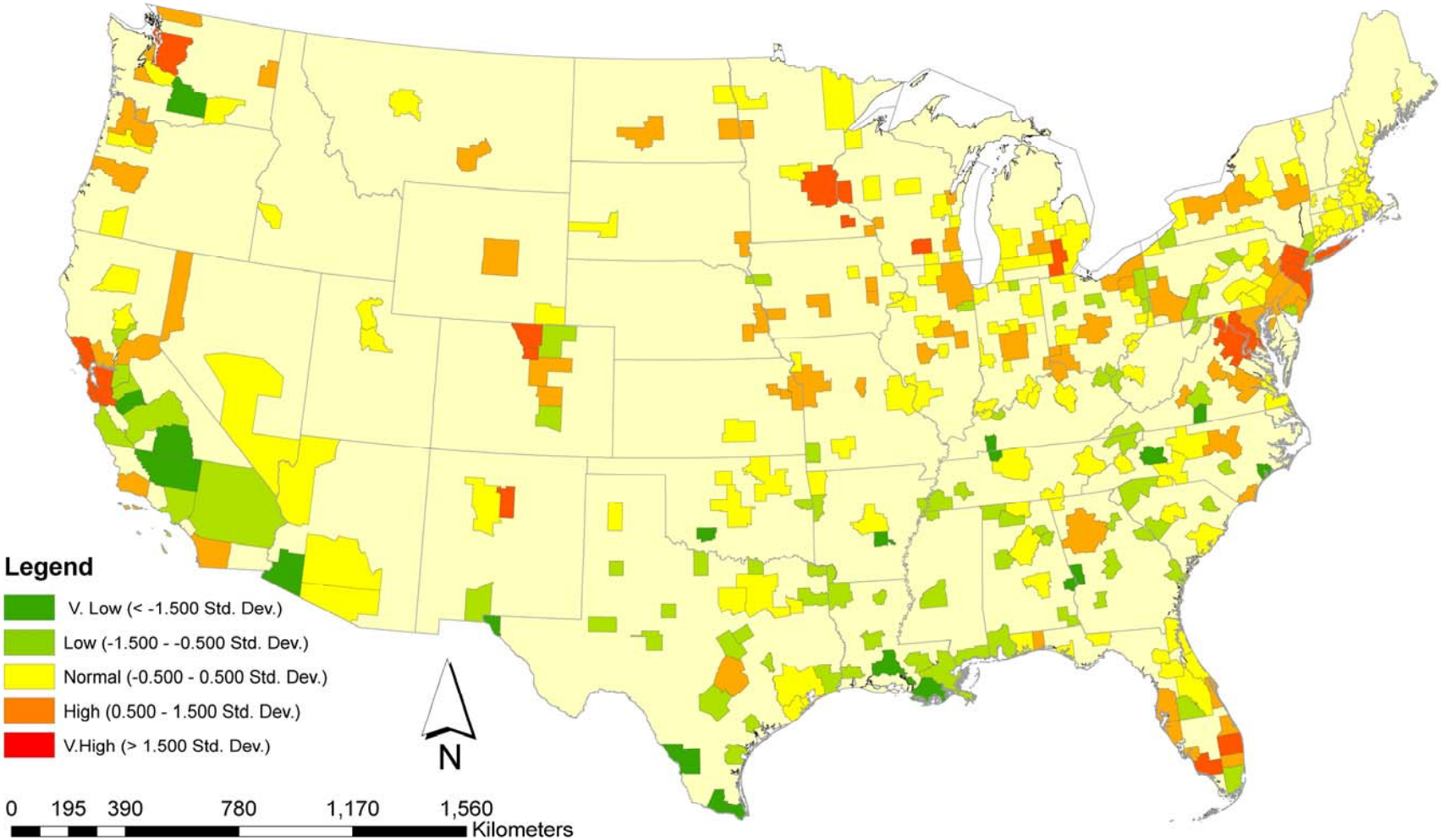
Distribution of Risk from Climate Change



Level of Stress Imposed on Climatic Systems



Distribution of Civic Capacity



Correlation - Risk, Stress, Civic Indices and CCP Status

		RISK Index	CIVIC Index	STRESS Index
CCP Status	Pearson Correlation	0.11	0.34	-0.34
	Sig. (2-tailed)	*0.06***	*0.00**	*0.00**
RISK Index	Pearson Correlation	1.00	0.00	-0.08
	Sig. (2-tailed)		*0.95*	*0.19*
CIVIC Index	Pearson Correlation	0.00	1.00	-0.21
	Sig. (2-tailed)	*0.95*		*0.00**
STRESS Index	Pearson Correlation	-0.08	-0.21	1.00
	Sig. (2-tailed)	*0.19*	*0.00**	

*significant at .05
**significant at .1

Environmental Planning and Sustainability Research Unit

The Hazard Reduction & Recovery Center at Texas A&M University

http://epsru.tamu.edu

Research supported by the U.S. National Oceanic Atmospheric Administration & the Institute for Science, Technology and Public Policy at Texas A&M University