

Green Cities:

Capacity, Diffusion
and Implementation
of Sustainable
Policies

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- Between 2005 and 2007, 1,055 mayors signed on to the Agreement
- Participating cities commit to take following three actions:
 - Strive to meet or beat the Kyoto Protocol **targets in their own communities**, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns;
 - Urge their state governments, and the federal government, to **enact policies and programs** to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol -- 7% reduction from 1990 levels by 2012; and
 - Urge the U.S. Congress to pass the bipartisan greenhouse gas reduction legislation, which would **establish a national emission trading system**

Research Questions

- To what extent, does diffusion vertically (state → local) and horizontally (local → local) explain sustainability efforts by local governments?
- Do certain intergovernmental policies (e.g. state mandates, federal grants) encourage local communities to adopt climate/sustainability initiatives?
- Why do some local governments move more aggressively to adopt climate/sustainability initiatives?

Research to Date

- Most research to date has focused on larger cities (>50,000 population) and covered considerably fewer respondents (27 to 264 cities).
- Early research attempted to discern the predictors for joining the ICLEI and adopting certain sustainability strategies (e.g. Jepson 2004, Saha and Paterson 2008, and Zahran et al 2008).
- More recently, scholars have focused on civic capacity measures to determine the predictors of implementation and ability of local government to sustain sustainability initiatives (e.g. Lubell et al 2009, Portney and Berry 2010, Wang et al. 2012).
- This research builds on earlier investigations to build a more comprehensive model.

The Study

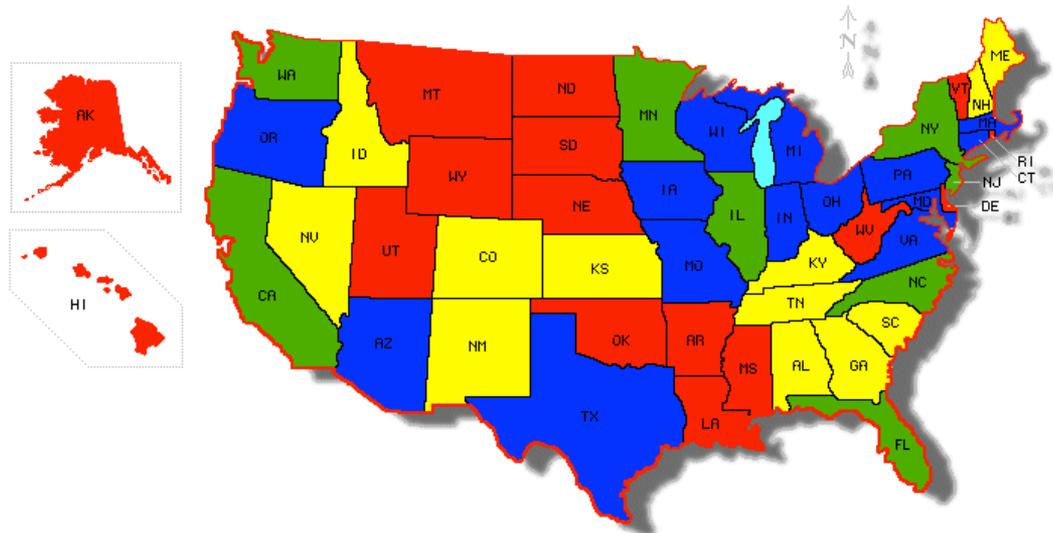
- Using the USCM signatories, a dataset of 812 cities has been developed to assess implementation progress on climate and environmental sustainability actions.
- Unlike published research to date, this dataset allows for greater analytical power to analyze how government capacity, economic interest and environmental risk variables ,and intergovernmental variables combine to help explain progress on sustainability initiatives.

Data

- Sample: 1,055 USCM signatories. Complete data on sustainability policies was obtained through city websites and available Census data for 812 cities ranging in size from 5,000 population to more than 8 million .

Cities in Mayor's Convention on Climate Change

- - 30 or more cities
- - 10-29 cities
- - 5-9 cities
- - 1-4 cities

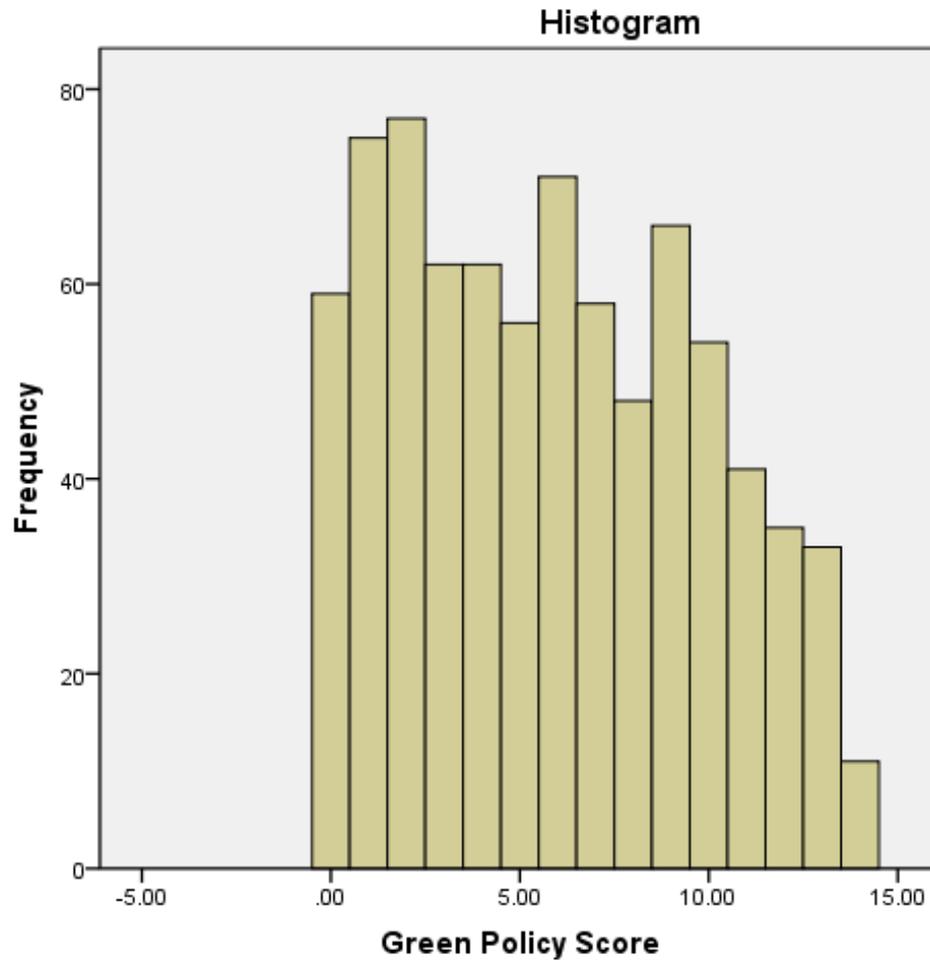


Data (Dependent Variable)

- A policy count of up to 14 sustainability initiatives in the following areas:

- Transportation Alternatives
- Energy Efficiency Programs
- Renewable Energy Efforts
- Public Sector Incentives
- Public-Private Partnerships
- Solid Waste Recycling
- Water Conservation Programs
- Land Use Regulations Promoting Compact Development
- Urban Forestry Programs
- Local Foods Initiatives
- Public Education Efforts Around Sustainability
- Adopted Sustainability Plan
- GHG Audit or Baseline
- Appointed Sustainability Commission or Board

Policy Counts



- Mean = 5.87
- StDev = 3.92
- N = 812

DATA (Control Variables)

- Municipal-level controls(hypothesized direction +/-)
 - + City population (log)
 - + Percent population growth since 2000 (log)
 - + Density (population/land area)
 - + Percent of population with a BA
 - + Average commute time
 - - Percent of population living in poverty
 - + Number of FEMA declarations since 1990
 - + Local Sierra Club chapter
 - + Percent of vote for Obama in 2008

Data (Predictor Variables)

- Community-level (hypothesized direction +/-)
 - + Council-manager form of government
(1 = Yes, 0 = No)
 - + Strong Mayor form of government
(1 = Yes, 0 = No)
 - + Years of tenure of current mayor (log)
 - + Staffing for Sustainability
(0 = none, 1 = interdepartmental team, 2 = separate sustainability office)
 - + Number of graduate university programs (0 to 4)

Data (Predictor Variables)

- State-level predictors
 - + State tourism spending per capita
 - + Total number of annual park visitors
 - + Participation in interstate climate organizations (1=Yes, 0=No)
 - + Total payroll of state FTEs in environmental functions
 - - Number of carbon-based mining & extraction operations

Data (Predictor Variables)

- Intergovernmental Predictor Variables
 - + State requires local planning or natural hazards planning(1 = Yes, 0 = No)
 - + EPA air quality sanctions (0 to 12 count)
 - + Federal EECBG funds received by city as part of the stimulus ARRA (log)

Methods

- This study used SPSS mixed models with restricted maximum likelihood.
 - OLS may not be appropriate as cities are nested within states with different policies.
 - A multi-level model is one approach to account for effects due to diffusion within states and to account for state-level effects.
- Initially, an “empty” multi-level model with no predictors was run to determine the extent of state-level variance.
- Subsequent analyses took account fixed and random effects of both state-level and city-level variables

Results

- 10.8% of the variance in city policy adoption is explained by the state alone (the “empty model”). In other words, Texas cities compared to California cities vary less than one might think due to state culture/politics.
- Inclusion of all state-level variables provides additional explanatory power accounting for 33.6% of the variance in local government policy adoptions.
- When including both city- and state-level predictors, the model explains 50.8% of the variation in city policy adoptions.

State Variables

- Only tourism spending is significant in multi-level regression. In other words, tourism dependent states are more likely to adopt sustainability policies.
- Surprisingly, state membership in a regional climate organization and state mandates for hazards planning are not significantly associated with local government policy adoption, though the associations are as expected in the positive direction.
- The presence of carbon-based businesses is also not significantly associated with fewer city policies, though the association is as expected in the negative direction.

Intergovernmental policies

- Carrots: Federal grant monies (EECBG) show the only significant and positive effect on city initiatives on sustainability. FEMA declarations by contrast are not significant predictors of sustainability policies.
- Mandates: State requirements for local planning and natural hazard planning do not show a significant positive effect on city policies.
- Sanctions: EPA penalties for non-attainment or air quality violations do not show a significant effect on city adoption of climate or sustainability policies.

What is the Best Thing to do?



Which Cities Adapt Most Aggressively

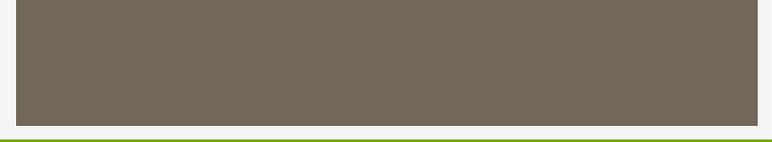
- Higher percent of residents holding a BA and the presence of university graduate programs.
- Larger population and thus larger EECBG formula funds.
- Council-manager form of government, a mayor of longer tenure, and a designated separate city sustainability staff.
- A lower poverty levels.
- Higher percentage of Democratic voters.

Conclusions & Speculations

- Cities most receptive to sustainability innovation are likely to be research university communities and larger urban areas.
- Rim cities with longer commute times and more Republican constituencies are less fertile territory.
- Stability in the local government structure matters.
 - Council-manager form of government, a mayor of longer tenure, and an established municipal sustainability office are more likely to embrace policy innovation.
 - A receptive strong mayor may also champion sustainability, but a successor strong mayor may as likely have different policy priorities.

Conclusions & Speculations

- Intergovernmental strategies like state mandates and EPA sanctions seem not to motivate local government innovation. However, intergovernmental grants like those provided through ARRA funding can spur local government policy adoption.
- Progress is possible in the reddest of red states, if policy entrepreneurs are strategic in finding receptive municipalities.



Thank You!