



Comparative analysis of environmental stewardship mapping in four U.S. cities: New York City, Chicago, Baltimore, and Seattle

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Introduction

- Environmental stewardship is a critical component of environmental governance in urban systems.
- Information on civic stewardship organizations is often sparse; few spatial analyses have been conducted on stewardship organizations.



Research Questions

- What are the spatial patterns of civic stewards in 4 cities?
- Can we identify hot and cold spots of stewardship?
- Do socioeconomic and vegetation data predict the number of stewardship organizations?

Methods

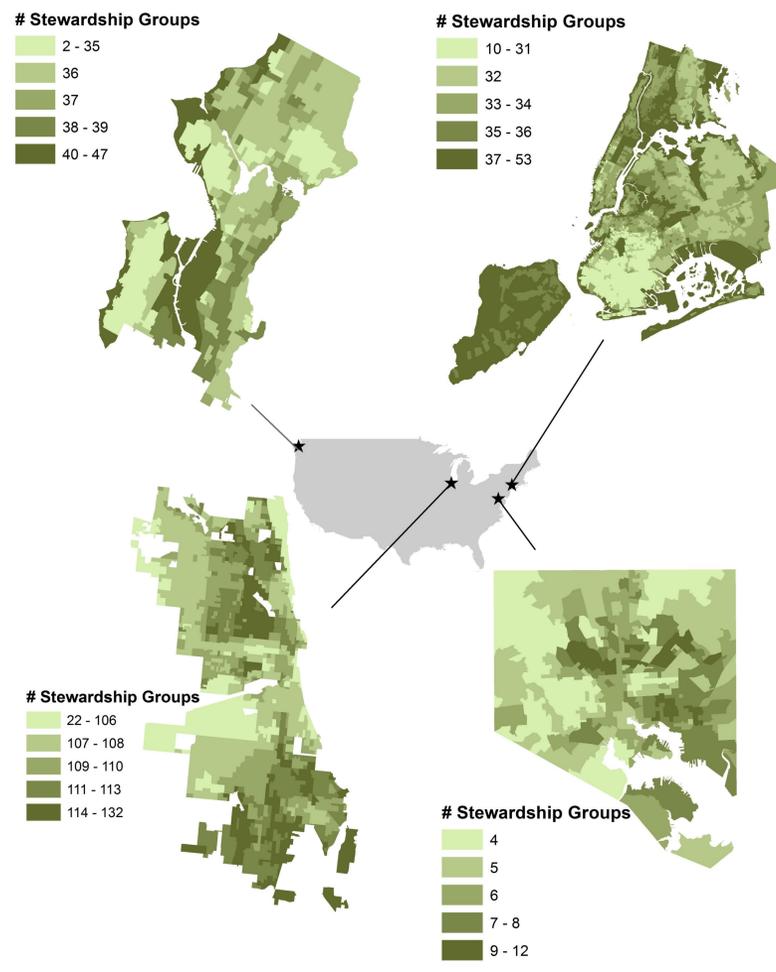
- **A stewardship turf is the spatial extent of a stewardship group's activities.**
- Using data from the Stewardship Mapping and Analysis Project (STEW-MAP), we examined spatial patterns of self-described stewardship turfs across 4 cities, by census block group.
 - New York City – surveyed in 2007; Chicago – surveyed in 2010; Baltimore – surveyed in 2011; Seattle – surveyed in 2011
- **Hot spots and cold spots are significant spatial clusters of high or low stewardship activity.**
- Variables included in analysis:
 - Number of stewardship groups (excluding city-wide groups)
 - % vegetation (derived from 2011 NLCD)
 - Census block group level 5-year American Community Survey estimates (2007 – 2011) on:
 - Median household income
 - Home ownership (% homeowners)
 - Race (% white)
 - Educational attainment (% with Bachelor's degree or higher)
- We used negative binomial regression models.

Examining Stewardship "Turfs"

Statistic	New York City	Chicago	Baltimore	Seattle
Median	10.39	37.15	93.13	3,244
Mean	13,420	29,500	3,283	23,910
Minimum	0.01	0.01	0.04	0.22
Maximum	193,500	119,200	58,830	53,700
% operating city-wide	26%	14%	1%	47%
Total Number of Civic Stewardship Groups	476	1245	501	95

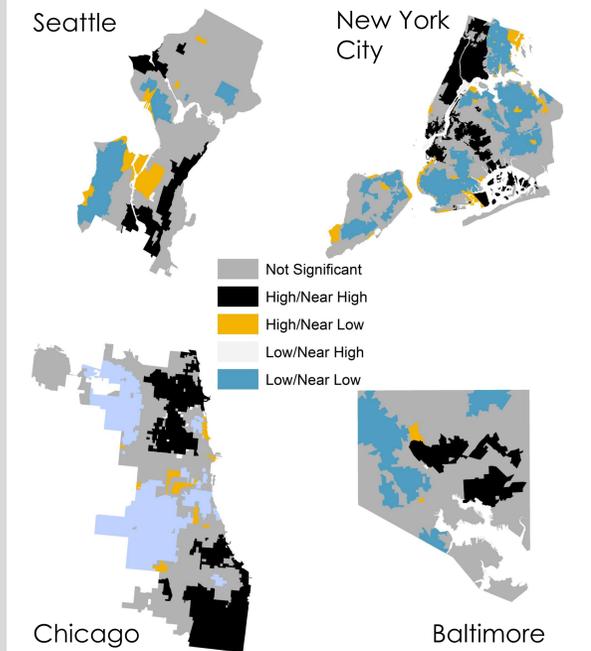
- Cities vary by % of stewardship groups operating city-wide
- Baltimore has the most localized turfs; Seattle has the broadest turfs (relative to city size)

Figure 1. Total number of stewardship turfs, aggregated to census block groups



Stewardship turfs aggregated to census block group, displayed in quintiles.

Figure 2. Hot spots and cold spots of stewardship turfs



Hot spots/cold spots calculated with Anselin Local Moran's I in ArcGIS

Regression Results

Negative binomial regression; dependent variable = # stewardship groups, excluding city-wide

New York City

	Standardized Estimate	z-value	P-value
% White	-0.013	-1.148	0.251
% Homeowner	-0.276	-24.551	0.000
% Bachelor or more	0.087	6.394	0.000
Median Household Income	0.042	3.024	0.002
% Vegetated	0.076	11.511	0.000

Cragg and Uhler's pseudo R²: 0.126
Fadden's pseudo R²: 0.04

Baltimore

	Standardized Estimate	z-value	P-value
% White	0.167	4.634	0.0000
% Homeowner	-0.162	-4.748	0.0000
% Bachelor or more	0.059	1.503	0.133
Median Household Income	0.015	0.368	0.713
% Vegetated	-0.041	-1.301	0.193

Cragg and Uhler's pseudo R²: 0.010
Fadden's pseudo R²: 0.003

Chicago

	Standardized Estimate	z-value	P-value
% White	-0.024	-3.483	0.000
% Homeowner	-0.040	-6.077	0.000
% Bachelor or more	0.085	11.355	0.000
Median Household Income	-0.020	-2.327	0.020
% Vegetated	0.030	7.681	0.000

Cragg and Uhler's pseudo R²: 0.011
Fadden's pseudo R²: 0.003

Seattle

	Standardized Estimate	z-value	P-value
% White	-0.098	-2.956	0.003
% Homeowner	-0.023	-0.604	0.546
% Bachelor or more	-0.059	-1.499	0.134
Median Household Income	0.044	0.974	0.330
% Vegetated	0.049	2.148	0.032

Cragg and Uhler's pseudo R²: 0.020
Fadden's pseudo R²: 0.065

Conclusions and Next Steps

- Relationships between the number of stewardship groups in an area and explanatory variables varied by city.
- This suggests exploring motivations for and organization of stewardship across cities.
- While many relationships were significant, models only explained a small portion of the variance.
- Spatial count models and other model forms will be investigated.