Urban Systems & Resilience to Climate Change:

A comparison of environmental governance networks in Baltimore & Seattle

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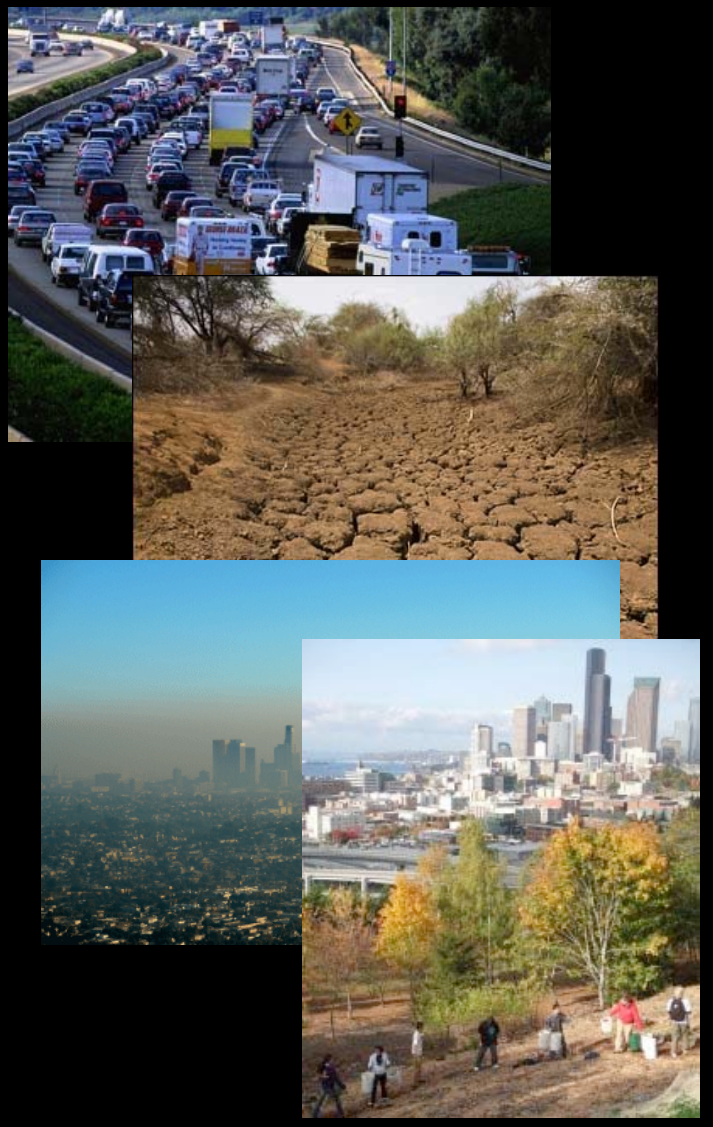
Overview

- Human Dimensions of Climate Change
- The Urban Context & BES Research
- Natural Resource Management & Governance Networks
- Network Research in Baltimore & Seattle
- Implications for Theory, Methods, and Practice

Human Dimensions of Climate Change

- *Diffuse impacts*
  - Human activities driving climate change may take place far from where the greatest impacts are experienced
  - Human impacts on climate can be hard to measure, let alone regulate
- *Variable responses*
  - Climate policy generally includes targets and large-scale reductions, not necessarily how to address on the ground individual or group activities at a smaller scale
  - New, localized approaches are needed to engage diverse populations of citizens and organizations with differing needs



Why study cities? The urban context

- *Rapid Urbanization of the 1900s*
  - 81% of population in US now lives in urban areas, leading to major changes in social and ecological structure and function
- *Urban Sustainability Policies*
  - 2005 Urban Environmental Accords:
    - created through partnership between cities, ICLEI, UNEP – signed by 100+ mayors from around the world
  - Living in a city = sustainability strategy?
- *Cities as Complex Systems*
  - Urban social-ecological systems must be studied as such, not as analogs of rural areas

BES Research:
From Sanitary City to Sustainable City

- *The Sanitary City*
  - Urban goals in the last century: making cities safe and healthy places to live

- *The Sustainable City*
  - In this century, goals are likely to include how to make cities more self-regulating, self-sufficient and adaptive

- *BES Long-Term Research*
  - Examines the transition in social & ecological features from the Sanitary City to the Sustainable City

From Sanitary City to Sustainable City

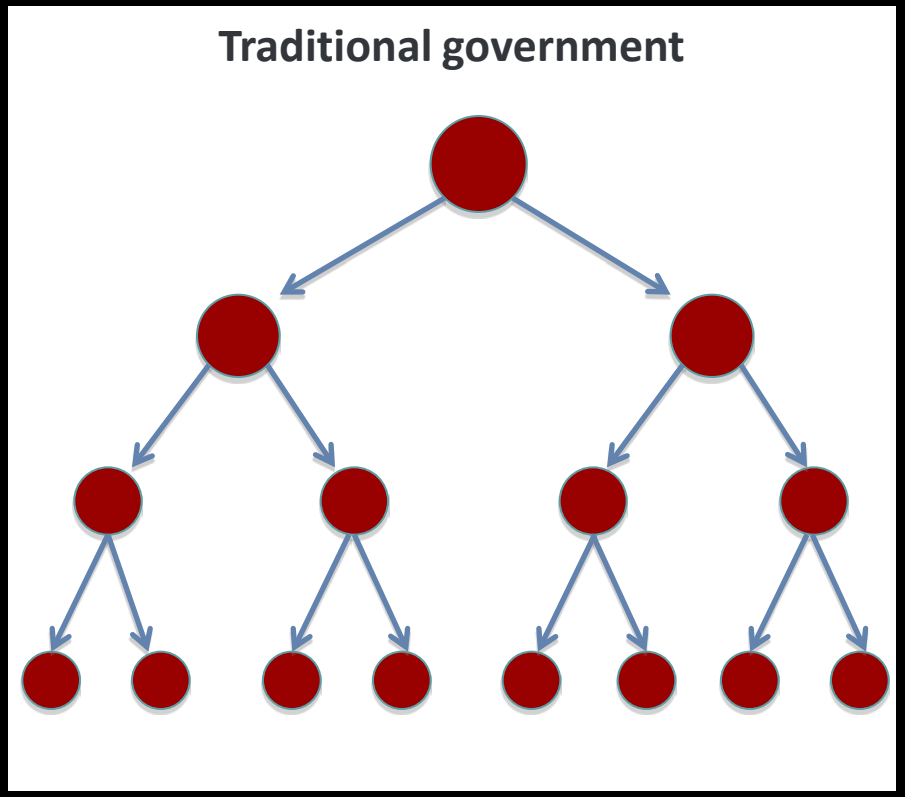
Key Principles	Sanitary	Sustainable
*Governance**	Technical / Regulatory	Polycentric / Mixed
Decision-making	Specialized & Separate	Generalized & Integrated
Stakeholders	Sectoral Segregation	Multi-Sectoral Linkages
Property & Benefits	Private / Private	Private / Public
Externalities	Minimize Negatives	Maximize Positives
Management	Individuals & Islands	Collectives & Mosaics
Design	Engineered: Gray	Bio-regulated: Blue & Green
Connectivity	Hyper-connected	De-coupled

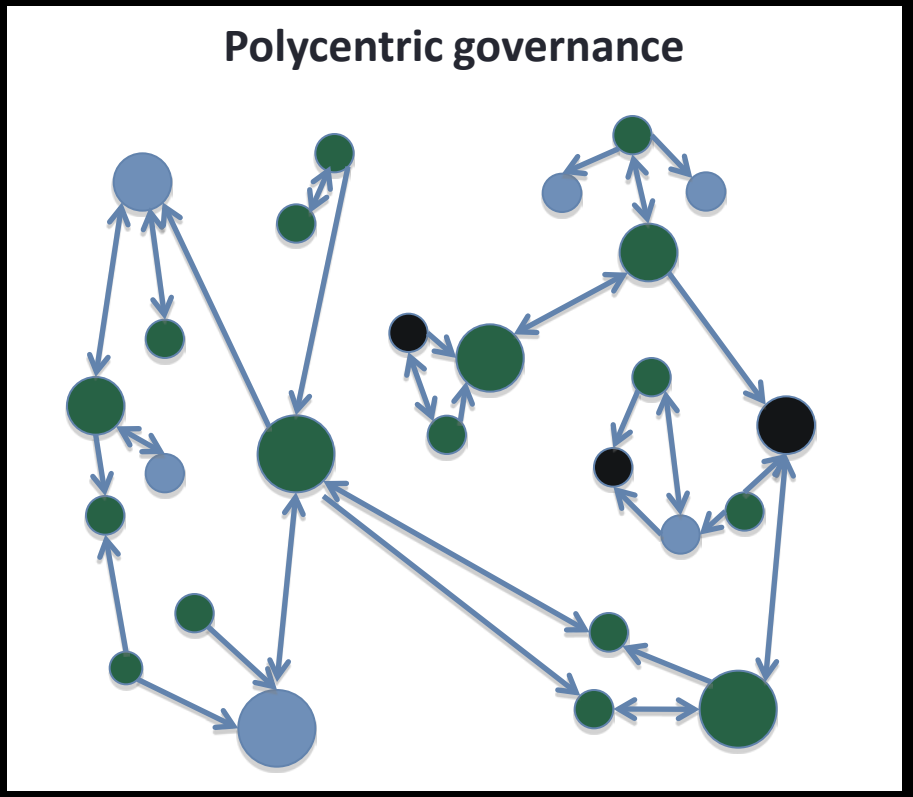
*Focus of this research

From Government of the Environment to Environmental Governance

- *Shifts in governance practices*
  - Complex systems require capacity to deal with change and uncertainty
  - Urban lands are a diverse patchwork of uses and ownership
  - Resource management approaches are changing to reflect these needs

From Government of the Environment to Environmental Governance





How can polycentric networks address natural resource management needs?

- *Networks include diverse perspectives*
  - This is important for effective management of land under different types of use and ownership
- *Networks are flexible and adaptive*
  - Governance networks can respond to change more quickly
- *Networks are resilient*
  - Changes in actors and relationships generally will not cause the system to collapse

Why study natural resource networks?

- *What we've learned from recent research:*
  - successful NR management often relies on collaborations through organizational networks
  - there are different types of network structures
  - network effectiveness can depend on structure
  - networks are not a panacea: some work, many do not
- *Lacking in the research:*
  - Studies analyzing how natural resource networks impact social and ecological outcomes, both spatially and temporally

What are the resource flows and pathways in governance networks?

- *Resources critical to inter-organizational networks*
  - Information/Knowledge
  - Financial
  - Human (staff, volunteers)

- *How do these resources flow through networks?*

Studying NR networks in Baltimore and Seattle

- *Research Goals*
  - To assess and compare the structure, formation, and outcomes of natural resource organizational networks in Baltimore and Seattle
  - To analyze Baltimore organizational networks over time, using BES data from 1998 and 2011
    - Data collected in 1998 pre-date Baltimore City and County sustainability initiatives
  - To contribute to BES long-term core data

Why Baltimore and Seattle?

Attribute	Seattle	Baltimore
Population	598,541	636,919
Household income (dollars)	61,055	39,083
% White	71	32
% Pop. 25 and older with Bachelor's degree or higher	53	24
Land area (sq mi)	84	81
% Tree canopy cover	18%	20%
Impacted water body	Puget Sound	Chesapeake Bay
No. of neighborhoods	82	249

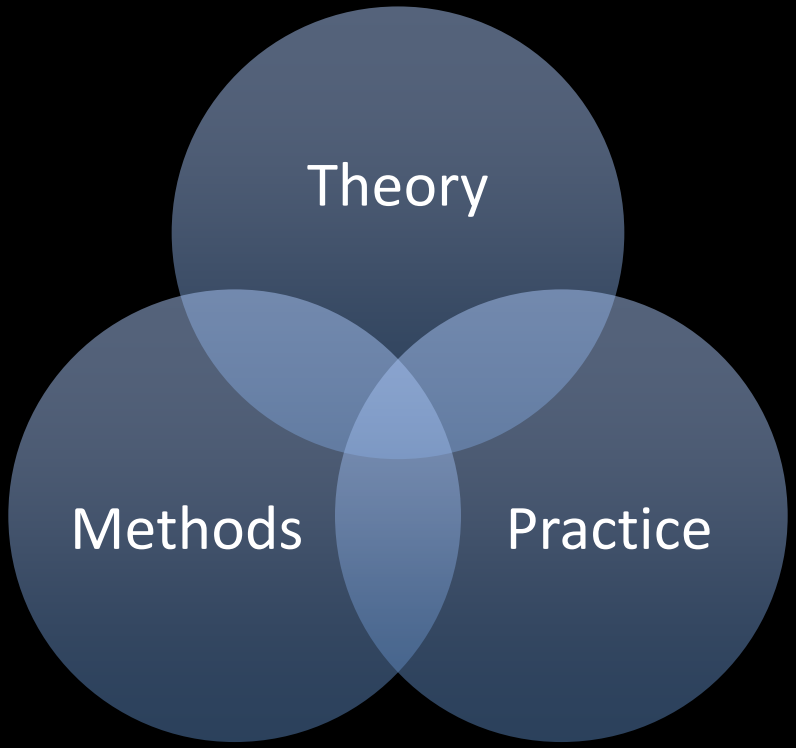
Research questions

1. What network relationships exist between natural resource stewardship organizations in Baltimore? In Seattle?
2. What is the spatial structure of these stewardship networks?
3. Do network structures affect social and ecological outcomes?
4. Do variations in social and ecological conditions predict the resulting network?
5. How do the networks in Baltimore and Seattle compare?

Methodology

1. *Identify the population.*
   - Use interviews & snowball sampling to develop list of organizations working on natural resource stewardship
2. *Survey the network.*
   - Collect data about organizational attributes, relationships, and geographic scope of work
3. *Analysis.*
   – Use GIS, social network, and statistical techniques to compare network data with social and ecological data at the neighborhood level, both within and between cities

Contributions



Implications for social-ecological theories

- *Environmental governance theories*
  - evaluating collaborative networks & NR management
- *Social network theories*
  - comparing network structures & outcomes, assessing network changes over time
- *Complex system theories*
  - examining resource flows

Contribution to social-ecological methods

- Combination of social network relational mapping and spatial analysis mapping
- Comparison of spatial network results to social and ecological data
- Longitudinal study of changes in network relationships and changes in social and ecological conditions
- Cross-city comparisons
- Studies of large-scale networks

Contribution to practice

- Publicly available interactive web mapping tool, listing organizations, their attributes, and where they work
- Begin dialogue on how to facilitate formation and maintenance of effective urban sustainability networks
- Contribute to practices of governance for local mitigation and adaptation to climate change

Thanks!

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