

Polycentric networks and resilience in urban systems:

A comparison of Baltimore & Seattle

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ESA 2010 Meeting



Overview

The Urban Context

Natural Resource Management & Governance Networks

Studying Governance Networks

Baltimore and Seattle

Implications for Theory, Methods, and Practice



Why study cities? The urban context

- Urbanization = defining characteristic of recent history:
 - Globally, 14% in 1900 → 50% in 2007
 - 81% in US
- Changes in social and ecological structure and function
- Urban ecosystems are complex systems to be studied in their own right, not only as analogs of rural areas
- Urban sustainability programs are being created to address these changes
- Living in a city: a potential sustainability strategy in itself



From Sanitary City to Sustainable City...

- **Sanitary City**
 - Goals included immediate concerns of waste removal, disease management, supply of clean water and clean air
- **Sustainable City**
 - Goals have expanded to include immediate and long-term environmental, social, and economic concerns
 - 2005 Urban Environmental Accords
 - created through partnership between cities, ICLEI, UNEP
 - include 7 urban sustainability goals
 - signed by 100+ mayors from around the world



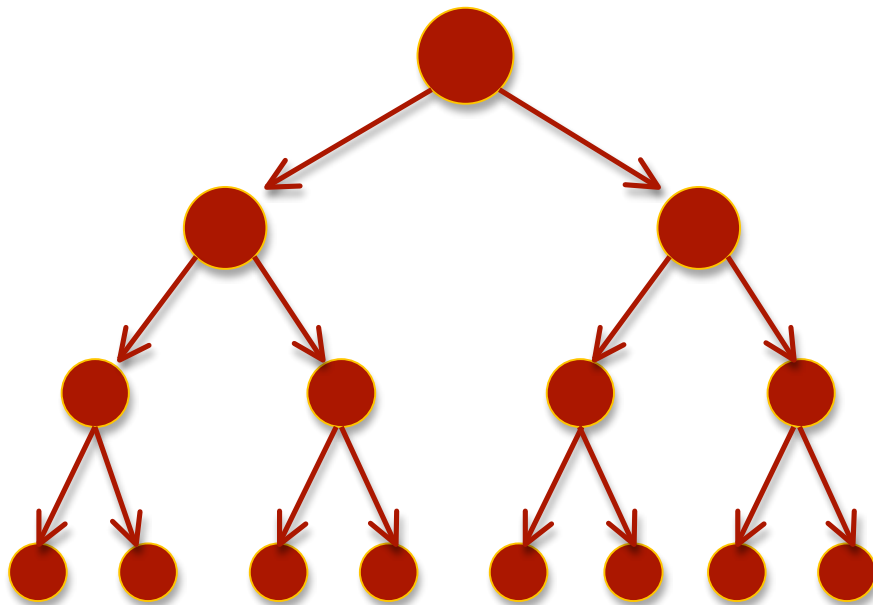
From government of the environment to environmental governance...

- Urban ecosystems are complex systems, requiring capacity to deal with change and uncertainty
- Urban lands are a diverse patchwork of uses and ownership
 - Sustainability may require an “All Lands, All Owners” approach
- Resource management approaches are adapting to reflect these needs
 - Traditional government is a top-down approach to environmental policy and implementation
 - Environmental governance involves a network of multiple levels of government as well as private and non-profit stakeholders

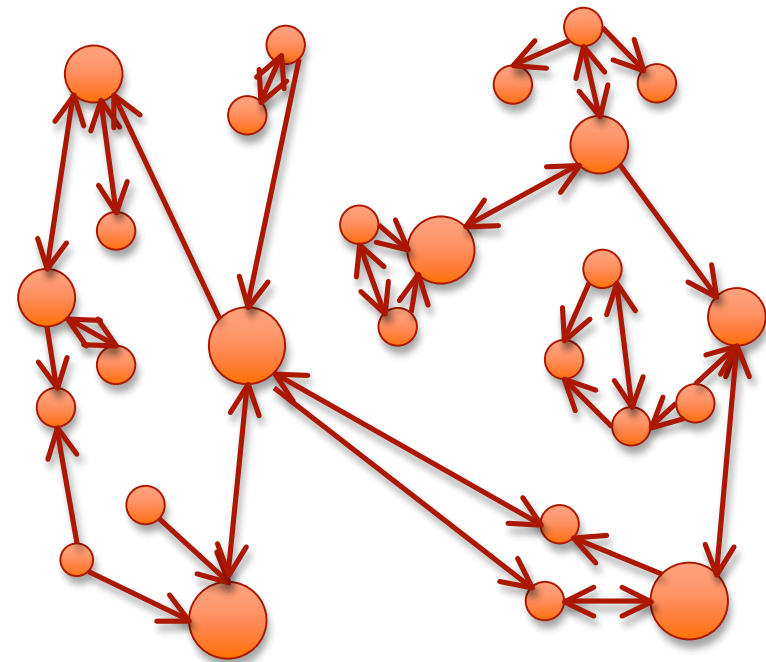


From government of the environment to environmental governance...

Traditional government



Polycentric 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?

- Networks are not a panacea: some work, many do not
- Lessons 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
- Lacking in the research are 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?

- Three main resources identified as critical to interorganizational networks:
 - Information/Knowledge
 - Financial
 - Human (staff, volunteers)
- How do these resources flow through networks?



Studying NR networks in Baltimore and Seattle

- Research Goal: To assess and compare the structure, formation, and outcomes of natural resource organizational networks in Seattle, WA and Baltimore, MD



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

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



Methodology

1. Identify the population.

Use snowball sampling to develop list of citywide organizations working on natural resource stewardship (~600 in Seattle)

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
- In Baltimore, compare with LTER network data collected in 1999 (prior to sustainability initiatives)



Contributions



Implications for social-ecological theories

- Environmental governance theory
 - evaluating collaborative networks & NR management
- Social network theory
 - comparing network structures & outcomes
- Organizational state theory
 - examining resource flows



Contribution to social-ecological methods

- Combination of GIS spatial mapping and social network relational mapping
- Comparison of spatial network results to social and ecological data
- Longitudinal study (in Baltimore) of changes in network relationships and changes in social and ecological conditions
- Cross-city comparisons of large networks



Contribution to practice

- Publicly available interactive web tool, listing organizations, their attributes, and where they work
- Begin dialogue on how to facilitate formation and maintenance of effective urban sustainability networks



Thanks!



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