



United States Department of Agriculture

# STEW-MAP in the Baltimore Region

Survey Results of the Stewardship Mapping and Assessment  
Project, 2011

Morgan Grove  
Dexter Locke  
Michele Romolini  
Molly Radwell  
Nancy Sonti



Forest Service

Northern Research Station

Publication Date January 2023

# EXECUTIVE SUMMARY

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Addressing the challenges of sustainable and equitable city management in the 21st century requires innovative solutions and integration from a range of dedicated actors. In order to form and fortify partnerships of multi-sectoral collaboration, expand effective governance, and build collective resiliency it is important to understand the network of existing stewardship organizations.

The term ‘stewardship’ encompasses a spectrum of local agents dedicated to the evolving process of community care and reformation. Groups involved in stewardship across Baltimore are catalysts of change through a variety of conservation, management, monitoring, transformation, education, and advocacy activities for the local environment - many with common goals of joint resource management, distributive justice, and community power sharing.

The Stewardship Mapping and Assessment Project (STEW-MAP) is a method of data collection and visualization that tracks the characteristics of organizations and their financial and informational flows across sectors and geographic boundaries. In 1999 data were collected in the Gwynns Falls Watershed and in 2011 the effort was expanded to Baltimore City. A survey asking about attributes and relationships was sent out to 607 groups, self-identified as working on environmental stewardship. Responses from 27.2% of the groups established a stewardship network connecting 390 organizations, 53% of the contacted population.

## Organizational trends:

- Majority (79%) were non-profits
- Strong community-group participation and school presence (25% of non-profits, 33% of public sector)
- Education was the most common form of stewardship, but over 90% of organizations participated in multiple
- Community gardens were the site-type with the most activity
- Individual donations were the leading source of funding; endowments and the federal government contributed the least

## Network trends:

- 51% of organizations were loosely or unconnected, with no network ties
- 2.8% of the network (11 organizations) held over 20% of the total connections
- The Parks and People Foundation alone held 4% of network ties
- Less than 1% of possible connections were utilized

## WHAT'S IN THIS REPORT

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This report uses data from the 2011 survey to answer basic questions about the stewardship organizations, networks, and their work in Baltimore's neighborhoods. Questions are answered visually and with key findings.

### WANT MORE?

We recognize that the data collected through the STEW-MAP survey are extensive and that many more analyses are possible than what we have included in this report. Because of this, we have created on-line tools for both network and mapping analysis. These tools have the STEW-MAP data already included. Links to these resources can be found at the end of this report.

Finally, our staff are available to discuss the Baltimore STEW-MAP data and analyses that might be of interest to you. Please contact Morgan Grove, Scientist and Team Leader for the USDA Forest Service's Field Station at [morgan.grove@usda.gov](mailto:morgan.grove@usda.gov) and we will do our best to answer your questions.

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# INTRODUCTION

## STEWARDSHIP IN BALTIMORE

Baltimore City's stewardship organizations represent a robust and extensive population that is highly committed to community care and support. They share a deep understanding of the connection between the environment and social well-being, with an emphasis on both a personal and group responsibility to engage and care for the city's inhabitants and resources. As a postindustrial city with past and persisting policies of explicit and implicit segregation, Baltimore's history and location create a unique set of intertwined social and biophysical stewardship opportunities.

Groups are mostly driven by social or faith-based motives, holding story-telling, learning, and knowledge-sharing as central to constructing inclusive networks of support and resiliency. Their view of stewardship is as a long term, intergenerational, and circular resolution.

## MAPPING STEWARDSHIP ORGANIZATIONS

A model of shared stewardship, which encourages the integration of groups with common social, economic and environmental aims to take joint action, is often inhibited by geographic, administrative, or sectoral barriers. Acknowledging the existence and maximizing the potential of these organizations and their networks can be a crucial step in urban governance moving forward, for policy shaping and establishing durable practices of sustainability.

The Stewardship Mapping and Assessment Project (STEW-MAP) is a mapping tool and database that tracks the ties between environmental stewardship organizations to construct a web of informational and financial flows across spheres and physical boundaries. STEW-MAP projects are currently being undertaken and expanded on an international scale; from Honolulu to Valledupar, Colombia.

## ABOUT THE 2011 SURVEY

This survey defined acts of stewardship as engagement in conservation, management, monitoring, transformation, education, or advocacy for the local environment.

607 organizations involved in environmental stewardship activities in Baltimore were identified through informant interviews, directories, and an organizational network study of 1999. During 2011, organizations received a questionnaire inquiring about their organization's activity, administrative structure, and information sharing practices. Organizations could name up to 40 others as related to funding, providing or receiving information, advice, or expertise.

The survey received 165 responses, who named an additional 225 organizations, for a total recognized network of 390 organi-

zations and enhanced population of 736 organizations participating in environmental stewardship activities across Baltimore City. Responses indicated that though a majority (53%) of environmental stewardship organizations in Baltimore participate in the network, 47% had no named connections to those in the network.

Given the construction of the network and survey format, the data represents the responding organizations, or 42.3% of the entire Baltimore stewardship network.

## ABOUT BES

The USDA Forest Service's Baltimore Field Station is a key member of the Baltimore Ecosystem Study and an international leader in the field of urban ecology research, training, and education. The Baltimore Field Station is a flagship federal research investment in the Chesapeake Bay Watershed for understanding relationships between urban and urbanizing areas and the Chesapeake Bay. Field Station researchers provide policymakers, government agencies, NGOs, local communities, and businesses with technical capabilities and application tools, scientific expertise, and unique information to facilitate urban natural resource stewardship; monitor and evaluate investments in green infrastructure; and promote environmental education and careers.



The Baltimore Ecosystem Study (BES) aims to understand metropolitan Baltimore as a social-ecological system. The program brings together researchers from the biological, physical, and social sciences to collect new data and synthesize existing information on how both the ecological and engineered systems of Baltimore work. As a part of the National Science Foundation's Long-Term Ecological Research Network, BES also seeks to understand how Baltimore's ecosystems change over long time periods. The ecological knowledge we create helps support educational and community-based activities, and interactions between the project and the Baltimore community are important components of our project. Such an integrative project includes many disciplines and many research and educational institutions, both in Baltimore and beyond.

The USDA Forest Service's Baltimore Field Station and the Baltimore Ecosystem Study are located on the campus of the University of Maryland, Baltimore County (UMBC) and have close ties to UMBC's Center for Urban Environmental Research and Education (CUERE) and the United States Geological Survey (USGS).



# STEWARDSHIP ORGANIZATIONS

The population of groups directly performing or supporting conservation, preservation, management, restoration, monitoring, advocacy, or education activities about the environment across Baltimore

## ORGANIZATION TYPE

*What types of organizations are engaging in stewardship?*

- Majority of organizations were non-profit
- Within the non-profits, over 25% were community groups without legal status
- Largest presence in the public sector was from school district organizations (33%)

Non-profit  
**78.5%**

|                                   |       |
|-----------------------------------|-------|
| 501(c)(3) (or has applied)        | 49.1% |
| Community group w/o exempt status | 26.4% |
| 501(c)(4) (or has applied)        | 3.1%  |

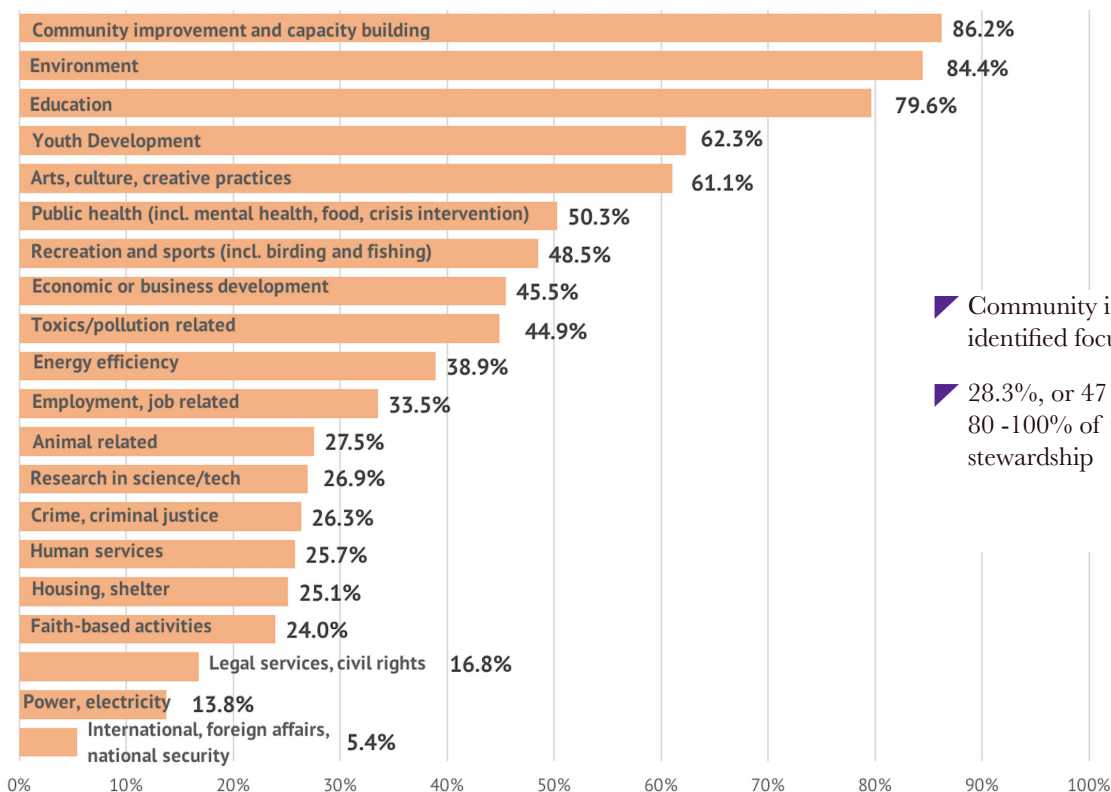
Public  
**18.4%**

|                    |       |
|--------------------|-------|
| School district    | 6.10% |
| Local govt agency  | 4.30% |
| Fed govt agency    | 2.50% |
| Quasi govt agency  | 2.50% |
| State govt agency  | 1.80% |
| Public Institution | 1.80% |

|         |       |
|---------|-------|
| Private | 1.20% |
| Other   | 1.80% |

## ORGANIZATION FOCUS

*What issues or topics are related to organizations' activities?*



- Community improvement was the most identified focus, chosen by 86.2%
- 28.3%, or 47 respondents, estimated that 80 -100% of their activities focused on stewardship



## STEWARDSHIP TYPE

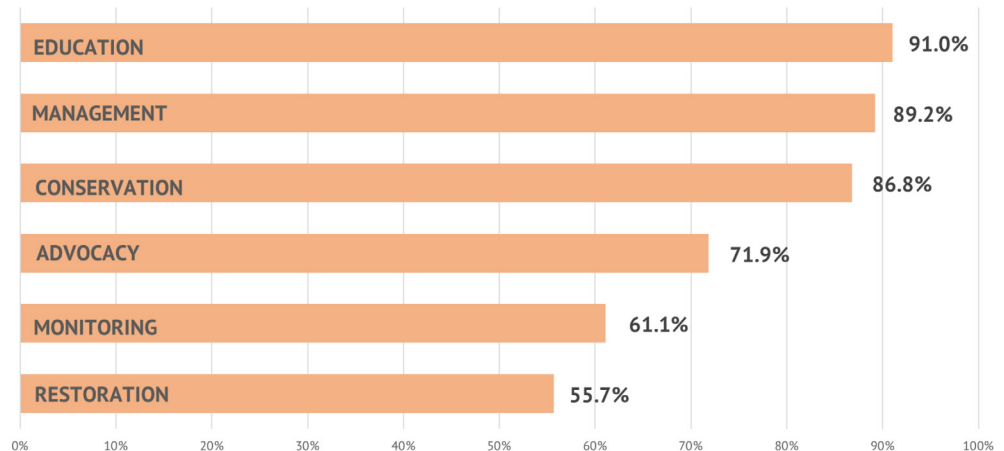
*What types of environmental stewardship do organizations perform?*

Over 90% identified with more than one form of stewardship

Education, the leading type, was identified by 152 organizations

Restoration, the least common, was still selected by over half of the organizations

57.2%, or 95 respondents, reported that over 40% of their activities were related to stewardship

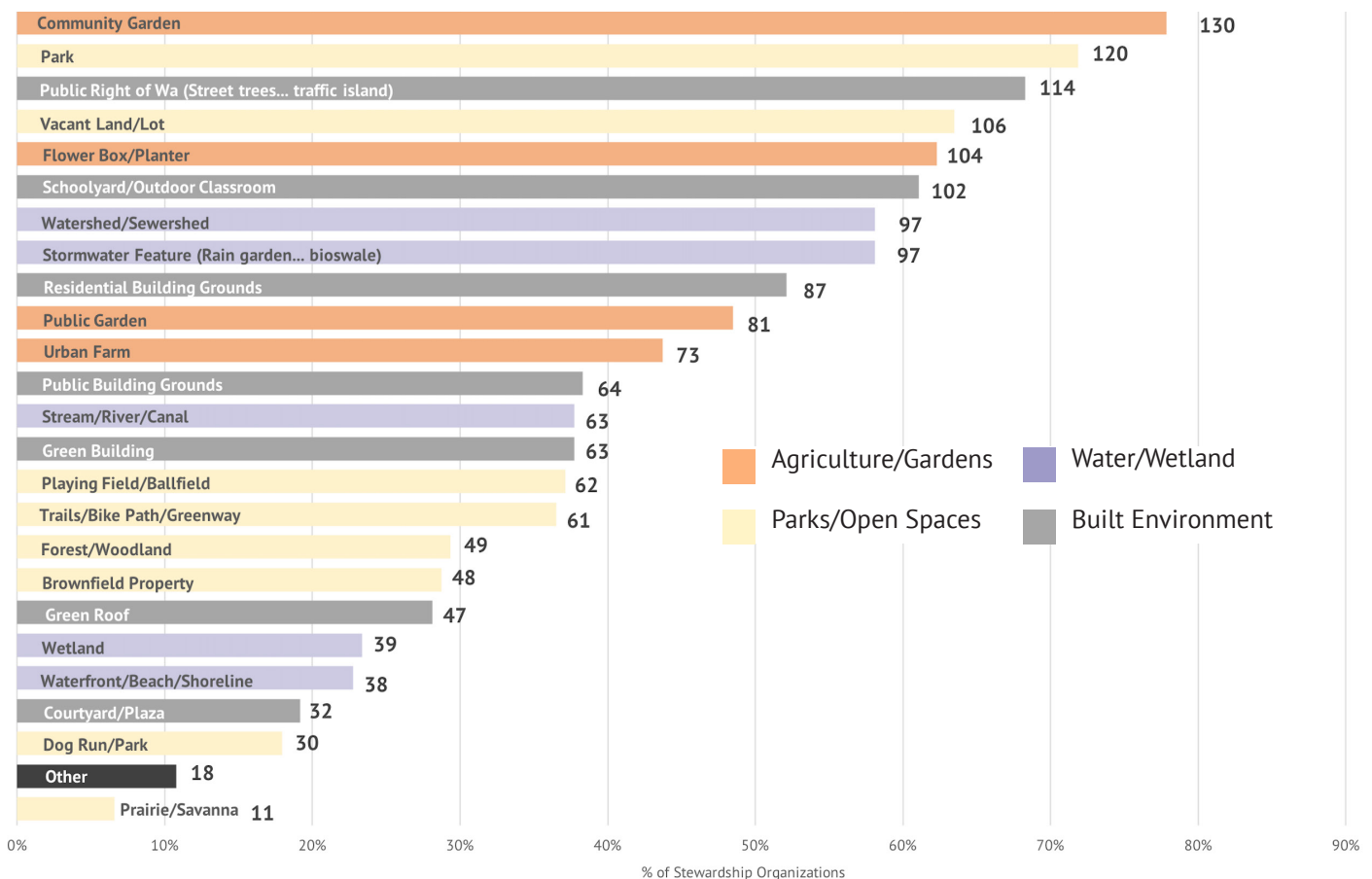


## SITE TYPE

*What sites do organizations work on?*

Majority worked on sites categorized as sites within “built environments”

78% participated in the most popular site-type; community gardens

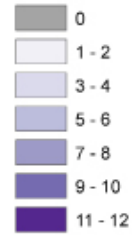


## SITE TYPE DISTRIBUTION

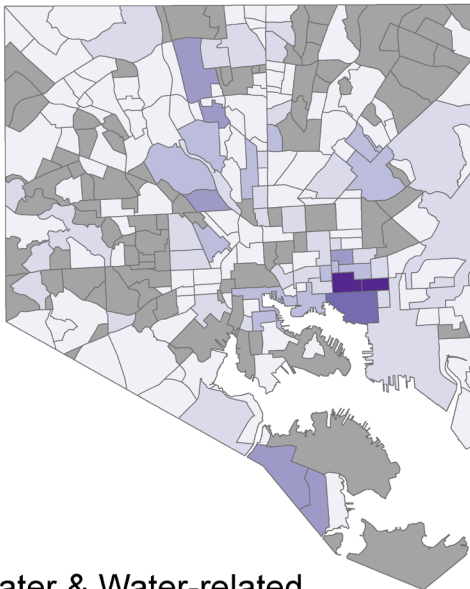
*What is the distribution of site-type stewardship across neighborhoods?*

- Highlandtown and Patterson Park had the highest organization count overall and for every site-type
- 90 neighborhoods have no organization dedicated to stewardship in that specific area

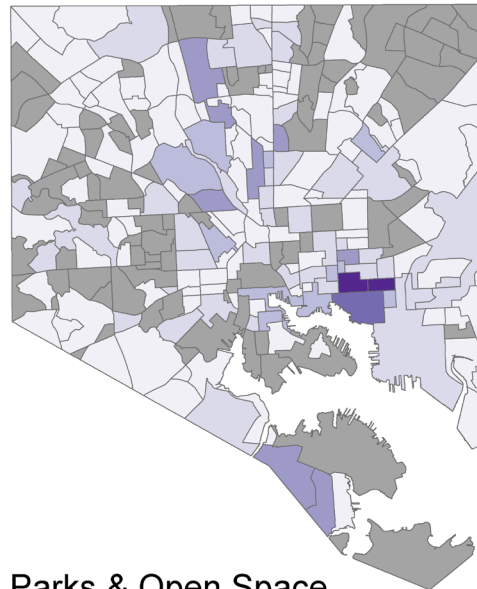
### Number of Organizations



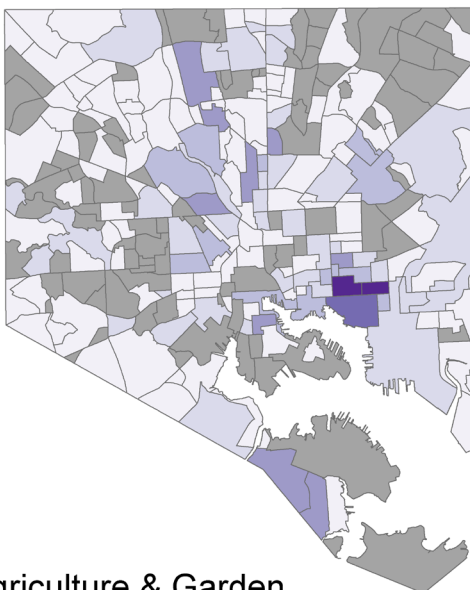
A. All Organizations



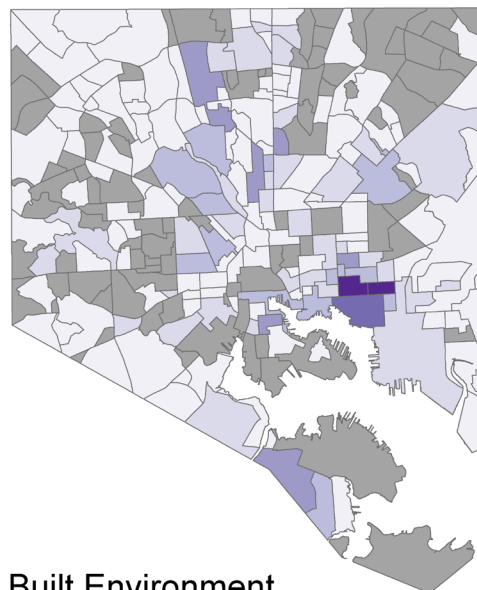
B. Water & Water-related



D. Parks & Open Space



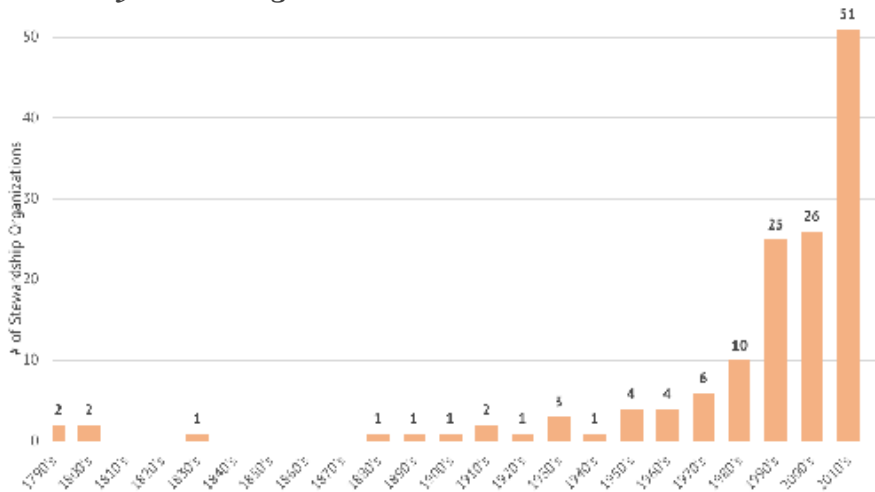
C. Agriculture & Garden



E. Built Environment

## YEAR FOUNDED

*What year were organizations established?*



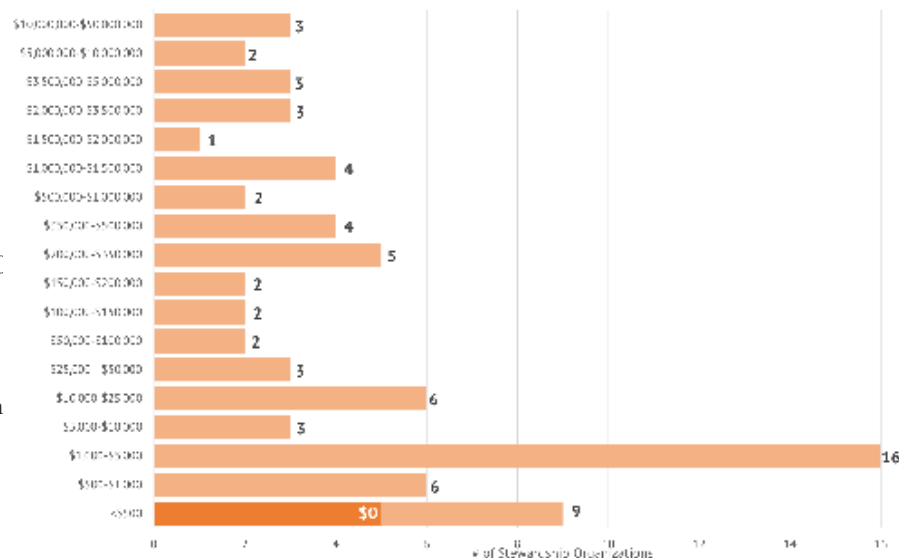
- 72.3% of organizations in the current network were established after 1990, with 54.6% since 2000
- Over 35% were founded after 2010
- Neighborhood associations, schools, and religious groups make up a majority of those founded before 1950

## BUDGET

*What are the estimated annual budgets?*

Only 45% of organizations provided a budget number.

- Majority operate with a budget below \$25,000
- 20% spend less than \$1,000
- 6.7% reported a budget of \$0
- Three highest budgets were above \$30 million with \$45 million being the largest referenced
- Median budget was \$19,000

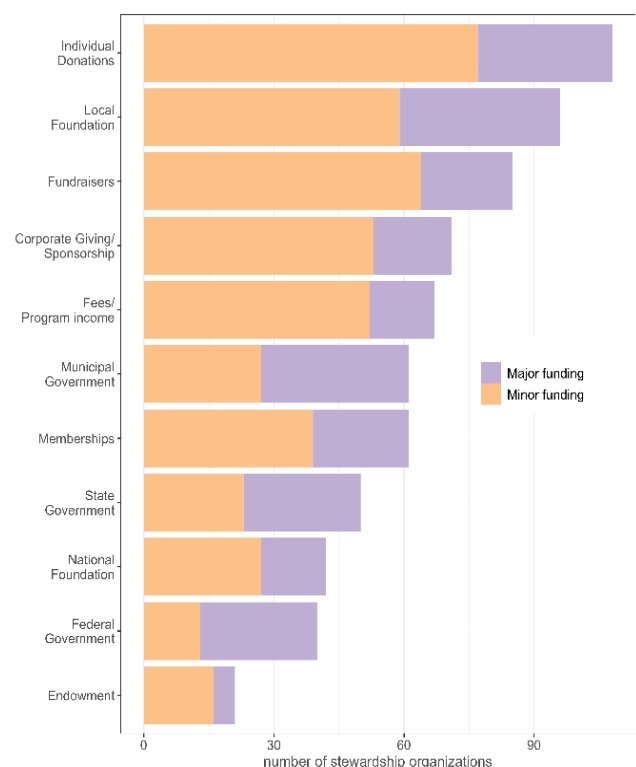


## FUNDING SOURCES

*Where are funds coming from?*

Non response rates ranged from 19.6% to 24.6%. Organizations were asked to specify if they received major, minor or no funding from the following sources. The percentage on the far right represents combined major and minor funding.

- Individual donations supported the most organizations overall (60%)
- Endowments provided major funds to only 2.8% of the network
- Local foundations were the largest source of major funding, giving to 20.7%
- 84% received government funds, near 50% of these relied on government for major support
- Public funding sources were the only category where it was more likely for an organization to be receiving significant funding than small amounts



# STEWARDSHIP NETWORK

The combination, arrangement and distribution of informational or monetary relationships between stewardship organizations across Baltimore

## CONNECTIONS OF AN ORGANIZATION

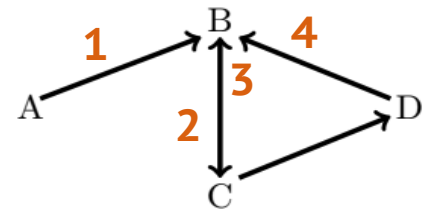
*How many ties exist to/from organizations?*

### DEGREE

*How many total connections does an organization have?*

Ex: B has a degree of 4

Highly connected organizations are “hubs” for diffusing information. However, they do not necessarily reach diverse portions of the network and the quantity of ties may indicate lack of strength.



#### In 2011

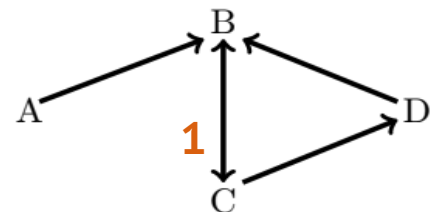
- The single most connected organization in Baltimore had 76 ties
- The majority (51% or 199 organizations) were found to be loosely or unconnected, with one or no ties to the network.
- 39.5% of organizations had only one tie
- 11.5% had none

### OUT-DEGREE

*How many out-going connections?*

Ex: B has an out-degree of 1

In general, organizations with high outdegree can reach many others and spark the flow of information across a network (but may not be the most efficient at spreading the information).



### IN-DEGREE

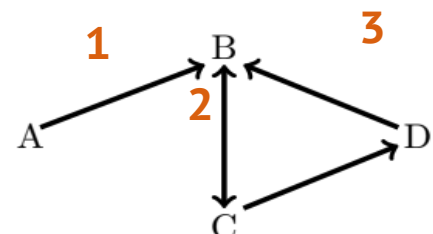
*How many in-coming connections?*

Ex: B has an in-degree of 3

In general, organizations with high indegree are the leaders, looked to by others as a source of advice, expertise, or information.

#### In 2011

- Top 2 organizations (Parks and People Foundation and Blue Water Baltimore) both had an in-degree of 23
- 56 organizations had an in-degree of 0
- 33.4% of the enhanced network had an in-degree of 2 or less
- 41.2% of the enhanced network had less than 5



## TOP 25 WITH 10+ IN-DEGREE

1. Parks and People Foundation
2. Blue Water Baltimore
3. Baltimore Office of Sustainability
4. Baltimore City Public Schools, Teaching & Learning
5. Civic Works
6. *Patterson Park Neighborhood Association*
7. Waterfront Partnership of Baltimore, Inc.
8. Baltimore Green Space
9. National Aquarium in Baltimore
10. United H.O.P.E. + SAY Together
11. Community Greening Resources Network (CGRN)
12. *Friends of Patterson Park*
13. Filbert Street Community Garden
14. *Belair-Edison Neighborhoods, Inc.*
15. Barclay Elementary and Middle School
16. *Baltimore City Alley Gating and Greening Program*
17. *Roland Park Country School*
18. *Civic Works, Real Food Farm*
19. Baltimore City Dept. of Transportation
20. *The Green School of Baltimore*
21. *Baltimore Medical System, Inc.*
22. *Southeast Community Development Corporation*
23. *Center for Watershed Protection*
24. *Project T.O.O.U.R., Inc.*
25. *Southwest Baltimore Charter School*

## DEGREE

**What is the quality of connections?**

A highly-connected organization is not necessarily the most effective or impactful.

Looking at an organization's scores of influence (betweenness) can help inform the strength of such connections.

Of the 25 organizations in Baltimore that held 10 or more in-degree ties, meaning they were frequently named by other organizations, only 13 also had the highest betweenness score.

*Italicized* organizations are those that had ten or more in-degree ties but are not in the top 25 for betweenness.

## TOP 25 WITH HIGH BETWEENNESS

1. Parks and People Foundation
2. Baltimore Office of Sustainability
3. Blue Water Baltimore
4. Community Greening Resource Network (CGRN)
5. *Baltimore City Dept. of Rec & Parks, Horticulture Division*
6. Baltimore City Public Schools, Teaching & Learning
7. United H.O.P.E. + SAY Together
8. *Baltimore City Dept. of Public Works, Surface Water Management*
9. Civic Works
10. *Baltimore Food and Faith Project*
11. Filbert Street Community Garden
12. *Maryland Dept. of Natural Resources: Program Open Space, Conservation Jobs Corps, Tree-mendous*
13. *Waterfront Partnership of Baltimore, Inc.*
14. TreeBaltimore
15. Barclay Elementary and Middle School
16. National Aquarium in Baltimore
17. Baltimore City of Dept. of Transportation
18. *Baltimore Free Farm*
19. Baltimore Green Space
20. *Albemarle Square Homeowners Association*
21. *Audubon Patterson Park Center*
22. *Maryland Pesticide Network*
23. *Roland Park Native*
24. *Baltimore Green Works*
25. *Baltimore City Forestry Board*

## BETWEENNESS

**How influential is an organization?**

*The number of times an organization lies between two organizations that otherwise would not be connected*

This bridging or brokering position is considered a measure of influence, and highlights quality of ties over quantity. However, many high betweenness scores within a network can indicate that large numbers of organizations are peripheral or receive information from limited sources.

*Italicized* organizations are those that were in the top 25 for betweenness but are not in the top 25 with 10 or more in-degree ties.

# CONNECTIONS ACROSS THE NETWORK

## CENTRALIZATION

### *How are connections distributed across the network?*

High centralization exists when few organizations hold most of the connections, which can be effective for collective action and coordination, but also increases network vulnerability and possibilities for asymmetry.

#### In 2011

- Relatively high centralization of 18% revealed that network connections were concentrated around a small number of organizations
- 11 organizations (2.8% of the network) held over 21.4% of the total connections
- A single organization held 4% of the ties

## DENSITY

### *What is the connective potential of the network?*

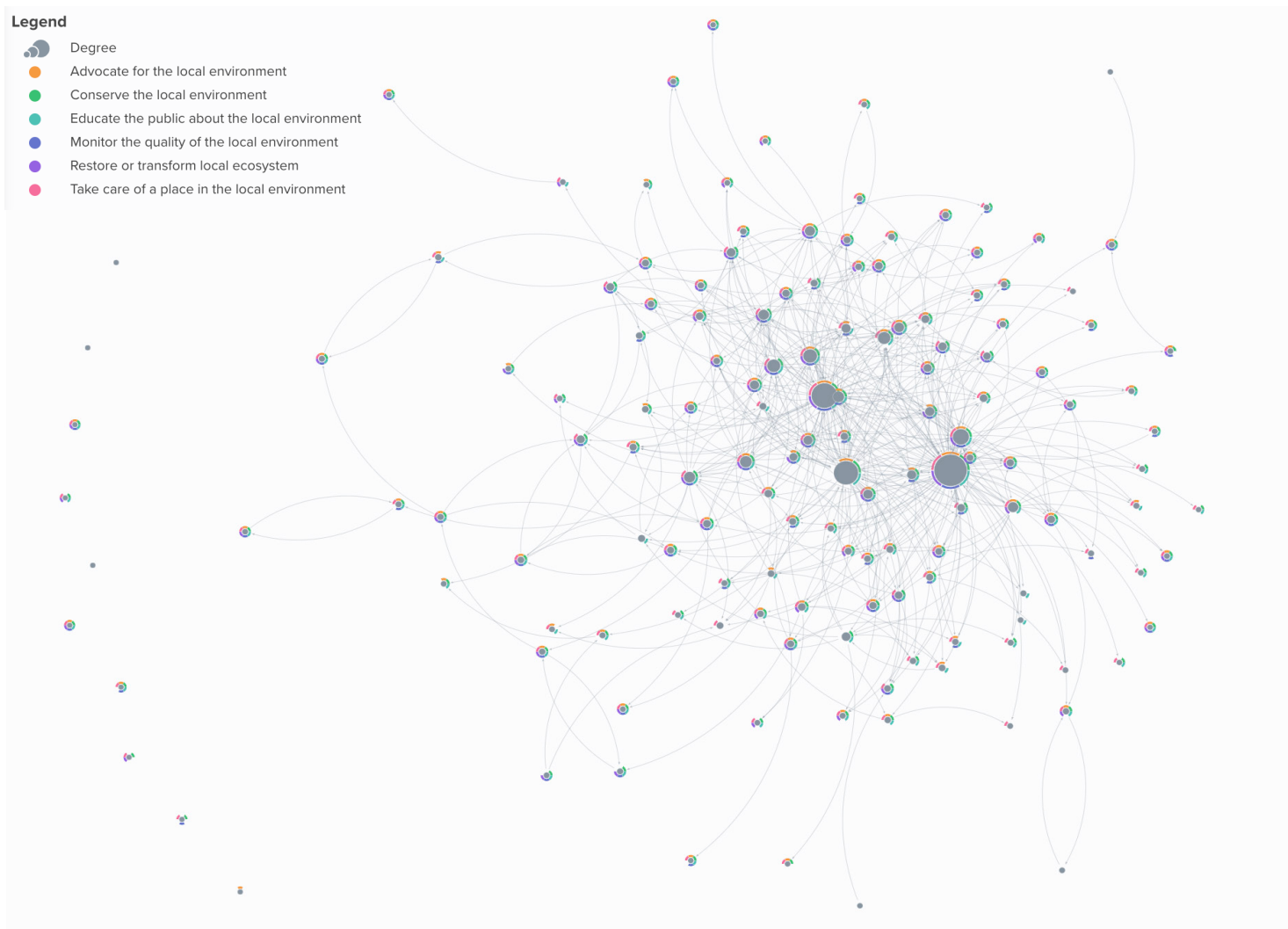
*The total number of connections in the network divided by the number of connections possible*

There is generally a positive relationship between density and joint action for natural resource management. High density can also enhance shared knowledge and understanding however it may inhibit the network's ability to adapt and receive new information.

#### In 2011

- 0.62% density means the network utilized less than 1% of the possible ties (fairly characteristic of large networks)

From KUMU - Online Network Visualization



18%  
CENTRALIZATION

0.62%  
DENSITY

6.83  
AVG DEGREE

## COMPARISON TO 1999 GWYNNS FALLS SURVEY

The survey results can be compared to organizational data collected in 1999 within the Gwynns Falls Watershed (GFW) to demonstrate regional shifts in stewardship activity as a starting point for assessing changes in the larger network. Over 12 years, 20 organizations continued to be active, 16 stopped working in the watershed or altogether, and 23 new organizations joined. An increasing number of organizations in Baltimore were demonstrated to have self-identified as participating in environmental stewardship, even if not the direct focus of their organization's mission.

Within the GFW, nonprofit-presence rose by 7% from 1999 to 2011. Public organizations overall decreased by 7%, though Baltimore City's agencies increased by 5% while state and federal prevalence declined by 6% each. The most influential organizations in the GFW became primarily Baltimore city public sector and nonprofit organizations, with three federal organizations prevalent in 1999 no longer within the top 10 most active in 2011. Additionally, the region saw a relatively substantial decrease in centralization of 14.5% from 36% in 1999, as well as a 3.5% decrease in density, indicating a more even distribution of connections and decreasing concentration.

The trends in the GFW uphold trends in governance shifts towards an increasingly interconnected polycentric network, with a reliance on multi-sectoral partners for management, service and delivery of public resources and goods.

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## ACKNOWLEDGEMENTS

Thanks to all of those who completed a survey, without you this work would be impossible. Additional thanks to our data providers, and the STEW-MAP community of practice.

Data providers: Baltimore Office of Sustainability, the Parks & People Foundation, TreeBaltimore, Baltimore Green Space, Baltimore Green Works, Blue Water Baltimore, and the Citizens Planning and Housing Association.



### For more information

Sonti, N., D. Locke, J.M. Grove, M. Romolini, S. Carpe, and M. Radwell. 2023. Baltimore Ecosystem Study: Stewardship Mapping And Assessment Project (STEW-MAP) survey results 2011 and 2019. Environmental Data Initiative.  
<https://doi.org/10.6073/pasta/ed8e2529ed68f9c697385d1bcf6eaf44>

STEW-MAP interactive map:  
<https://www.nrs.fs.usda.gov/STEW-MAP/baltimore>

Network Data Visualization:  
<https://kumu.kumu.io/stewardship-networks-in-baltimore>

Original 2011 data:  
Cary Institute Of Ecosystem Studies and M. Romolini. 2016. Stewardship Mapping And Assessment Project (STEW-MAP) ver 120. Environmental Data Initiative.  
<https://doi.org/10.6073/pasta/d1102f6505c48a107a5a27fd942fbaec> (Accessed 2023-02-01).

### Contact:

Morgan Grove, PhD, [morgan.grove@usda.gov](mailto:morgan.grove@usda.gov)

