

## **Civic stewardship & urban climate governance: opportunities for transboundary planning**

Holly Caggiano<sup>1</sup>, Laura F. Landau<sup>2</sup>, Lindsay K. Campbell<sup>3</sup>, Michelle L. Johnson<sup>3</sup>, Erica S. Svendsen<sup>3</sup>

<sup>1</sup>Princeton University, Andlinger Center for Energy & the Environment, Princeton, NJ, USA

<sup>2</sup>Rutgers University, Department of Geography, New Brunswick, NJ, USA

<sup>3</sup>USDA Forest Service, New York City Urban Field Station, New York, New York, USA

### **Abstract**

Using interview data with civic environmental stewardship groups in New York City (n=26), we identify strategies through which civic stewards engage in transboundary environmental governance and urban climate adaptation planning. Our findings articulate the diverse ways that civic stewards engage with planning in urban socio-ecological systems, as they 1) shape physical spaces, 2) broker partnerships, 3) disrupt the status quo, 4) build civic capacity, and 5) envision new futures. We contribute to the literature by embedding civic stewardship within urban planning discourse, suggesting partnerships between civic stewards and government planners that facilitate the co-production of innovative urban climate governance efforts.

**Keywords:** civil society; climate planning; environmental governance; socio-ecological systems; stewardship; urban sustainability

### **Corresponding Author:**

Holly Caggiano, Princeton University, 86 Olden Street Princeton, New Jersey 08540 USA

**Acknowledgments:** We extend our gratitude to the civic stewards who took the time to speak with us and share their insights. We also thank Keith Nislow and Beth Larry for feedback on an early version of the manuscript, the anonymous reviewers for their thorough and thoughtful reviews, and Rutgers University's Center for Resilient Landscapes for facilitating this collaboration.

## **Introduction**

Cities face unique social and ecological challenges exacerbated by climate change, including physical and economic recovery after extreme weather events, access to fresh food and clean water, sustainable energy generation, and compounding social vulnerabilities (Carter et al. 2015; Doherty et al. 2016). Local planning and governance are essential to prepare for and respond to climate impacts (Baker et al. 2012; Reckien et al. 2018). Adaptation entails preparing for and adjusting to future climate conditions and the wide-ranging, and geographically specific impacts of climate change (Field 2014), which will require a diverse set of public, private, and civic actors (Keenan 2018). While local government actors often take leadership roles in climate adaptation planning (Baker et al. 2012), civic stewardship groups also work to sustain and enhance urban ecosystems, manage ecosystem services, and strengthen civic capacity (Connolly et al. 2013, 2014). Civic stewardship is defined as processes led by non-governmental organizations and civic groups that conserve, manage, monitor, educate about, advocate for, and transform their local ecological and socio-economic environments (Campbell and Svendsen 2008; Campbell et al. 2019). Civic stewards are distinct from other civic groups and other third sector organizations as they make claims on specific spaces as they engage in caretaking of urban environments (Campbell et al. 2021). While not all stewardship groups work directly in climate adaptation, scholars have deemed a “culture of caretaking” a necessary element of climate work (Chazdon 2020). Stewardship has also emerged in the context of multiple forms of socio-natural disturbance, including climate-related disasters such as tornadoes, hurricanes, and pest invasions, as well as socio-political disturbances such as terrorism and uprisings (Svendsen and Campbell 2010; Tidball and Krasny 2014; Chan et al. 2015; Campbell et al. 2019; Landau et al. 2021).

Adaptation to the many challenges of and crises driven by climate change takes place on multiple scales through a variety of public, civic, and private stakeholders (Pauw and Chan 2018), and through both formal and informal institutions (Agrawal and Perrin 2009). Anguelovski and Carmin (2011) define urban climate governance as “the ways in which public, private, and civil society actors and institutions articulate climate goals, exercise influence and authority, and manage urban climate planning and implementation processes” (p. 169). While governments at each level play the role of coordinating the efforts of non-state actors, they also often rely on these actors for resources and expertise through government-civil society partnerships (Bauer and Steurer 2014; Harman et al. 2015). Graham and Mitchell (2016) draw on the concept of “boundary organizations”, groups that connect knowledge to practice to integrate science and policy, to illustrate how these groups enhance urban climate governance efforts by disseminating knowledge, building capacity, and engaging diverse coalitions of participants in the planning process. Recent literature calls for collaborative climate planning for local adaptation and resilience efforts (Broto et al. 2015; Barton et al. 2015; Flyen et al. 2018; Meerow and Woodruff 2020).

This research seeks to 1) embed the roles of civic stewardship groups within the broader planning discourse around urban environmental governance and 2) illustrate examples of the diverse transboundary roles civic stewardship groups play in urban socio-ecological systems that could be leveraged to advance climate adaptation planning. Here, we refer to Sternlieb et al.'s (2013) conceptualization of transboundary organizations as those that transcend social, political, economic, cultural and ecological boundaries that are both *fiat* (human-demarcated) and *bona fide* (physical). A substantial existing body of literature addresses how planners can incorporate local communities into decision-making processes, but less work explores the capacity of civic

stewards to partner with government planners in response to environmental change. Through analyzing interviews with civic stewardship organizations, we investigate the roles through which civic stewards are positioned to engage in urban climate governance efforts in partnership, and sometimes in tension, with government planners. Through analysis of in-depth interviews with civic stewardship groups, we illustrate that civic stewards engage strategically in governance efforts and act as essential partners to state planners to forge best practices in planning urban environments through community-led initiatives (Simon et al. 2020). In a study of adaptation planning in 156 US cities, Shi et al. (2015) found that while funding and political support might constrain regional planning bodies, governments can overcome these barriers by “facilitating the exchange of information, pooling and channeling resources, and providing technical assistance to local planners” (191). Following this finding, we examine the roles civic stewards play in urban climate governance efforts, highlighting their synergies and tensions with government-led planning contributions.

## **Background**

### *Civic engagement in environmental & climate adaptation planning*

Planning processes and community engagement have emerged as a central research theme in the past 30 years of literature (Fang and Ewing 2020), prompting scholarship to develop multiple conceptualizations of the role of the public, including civic organizations, in environmental planning. This literature touches on civic environmentalism (Agyeman and Angus 2003), collaborative land use management (Mason 2007), citizen science (Macaraig 2015; Newman et al. 2020), and citizen planning (Lord et al. 2017). While substantial work has questioned what roles an active citizenry can and should play in urban environmental planning efforts, institutionalizing civic engagement has proven difficult, specifically in terms of

stakeholder diversity and timing of participation (Hum 2010; Christiansen 2015). Case studies critique urban climate governance specifically as lacking civic participation that is both robust and sustained (Sarzynski 2015).

Through detailed case study research, Sarzynski (2015) identifies five elements that characterize the structure of participation in governance: who participates, when participation happens, what happens, how much participation, and why actors participate. These dimensions follow Arnstein's theorized ladder of citizen participation, ranging from the lower levels of non-participation to the highest levels including "delegated power" and "citizen control" (Arnstein 1969). The middle rungs, characterized by "token" forms of participation, are most often problematized by scholars – when efforts to foster participation are perceived by the public as insincere, it can result in hostility and distrust instead of effective collaboration (Irvin and Stansbury 2004). Others critique civic participation as coming at the expense of efficiency, citing shortcomings including lack of participation in American public policy, lack of necessary technical expertise, and overwhelming complexity of technological and social issues (Fischer 2009). In a recent study of participatory planning in action, Legacy (2017) distinguishes between formal participatory planning channels provided by governments and citizen participation outside of these channels. Legacy proposes that when citizens perceive the parameters of formal participatory planning as narrow, residents and community-groups might feel compelled to move outside of these channels and engage in informal campaigning, protest, or advocacy of alternative plans.

To overcome barriers to successful civic participation in planning, Kasymova and Gaynor (2014) suggest ensuring involvement is promoted *collaboratively*, illustrating clear benefits for both civic participants and government administrators. The term 'collaborative planning'

emerged in planning literature in the 1990s, broadly advocating for the democratization of planning processes (Allmendinger and Tewdwr-Jones 2005). Healey's (1997) conceptualization of collaborative planning argues for 'inclusionary argumentation,' which acknowledges diverse public contributions with the goal of improving economic, social, and environmental quality in urban spaces. Healy explains that while city planners are "typically associated with technocratic 'representative' governance" (244), stakeholders outside of government also engage in local governance. Healy's collaborative planning model theorizes an active role for civil society based on organizing to achieve common goals.

In turn, many scholars have linked civic engagement, including the involvement of civic groups, to planning processes in the context of climate adaptation. Early studies advocate for institutional arrangements that prioritize adaptation responses that value local knowledge (Allen 2006; Agrawal and Perrin 2009). Other strands of literature explore the concept of partnerships between government and private actors to close the climate adaptation funding gap (Compas 2012; Pauw and Chan 2018). Harman et al. (2015) identify five distinct types of urban partnerships that link diverse groups in efforts to adapt to climate change: public-private partnerships for infrastructure, partnerships for urban regeneration and development, partnerships for disaster risk, regional collaboratives, and local government networks. Despite increased utilization of participatory planning processes at the local level, barriers to engagement and inequitable outcomes persist (Rudge 2021). Wamsler et al. (2020) cites a lack of organizational flexibility in municipal government to effectively support meaningful civic engagement in climate adaptation efforts. In response to limited organizational flexibility across levels of government, innovative partnership models are needed to facilitate sustained civic engagement.

As urban change progresses rapidly, growing environmental and social issues demand new conceptualizations of civic engagement that capture alliances and tensions between government planners and civil society, as wicked problems like climate change require an “all hands” approach. Jabareen (2015) captures this in a framework of integrative urban governance, as diverse institutions integrate to develop new capacities. Embedded within local communities dealing with the current and future effects of climate change, we explore the potential for civic stewardship groups to strengthen the participatory processes essential for resilience (Woodruff et al. 2018).

#### *Civic environmental stewardship*

Fisher et al. (2012) define environmental stewards as “civic groups that conserve, manage, monitor, advocate for, and educate about a wide range of quality-of-life issues in urban areas” (p. 28). A body of literature covers the activities, impacts, and functions of local stewardship groups, as well as the role civic stewards play among diverse groups of actors from private industry to state governments. Connolly et al. (2013) find that civic stewards often serve as “bridge organizations between public agencies and civic organizations, working across scales and sectors to build the flexible and multi-scaled capacity needed to manage complex urban ecosystems” (p. 76). Informal organizational structures and capacity for adaptability position small, community-based groups as effective collaborators (Takahashi and Smutny 2001). Bennett et al. (2018) present an analytic framework that considers the significance of actors, motivations, and capacity of civic stewards influenced by social-ecological context and change, which leads to ecological and social outcomes. Enqvist et al. (2018) link stewardship work to sustainability transformation as a ‘boundary object’ that might push forward collaborative efforts and increased dialogue between diverse actors. They highlight the different ways in which others

operationalize ‘stewardship’ in the literature – through ethic, motivation, action, and outcome. The dimensions of care, knowledge, and agency throughout the literature link together these meanings.

Scholars theorize urban ecological stewardship as arising from social movements that express concern for environmental problems (Fisher et al. 2012), but stewardship groups are also sometimes born out of government agencies seeking to build civic capacity (Krinsky and Simonet 2012). While primarily operating on local scales, stewardship groups vary in the activities they perform and the site types they work on, including but not limited to street and riparian corridors, vacant lots, public parks, community gardens, and green roofs (Campbell and Svendsen 2008). Civic stewards engage in conservation, management, monitoring, education, and advocacy work, and recent literature shows their capacity to transform urban environments at a systems level (Landau et al. 2019). Stating that civic stewards ‘transform’ their environments acknowledges their role in changing ecological or social systems such as food, energy, water, waste, and social networks. More critically, other scholarship situates the volunteer work of citizens like civic stewards as a response to neoliberalization of public services and urban infrastructure, outsourcing labor that was previously a role of local government (Rosol 2012; Krinsky and Simonet 2012).

Civic stewardship groups play a wide variety of roles in socio-ecological systems, depicted by scholars as bridge organizations (Connolly et al. 2013), as being arrayed in complex networks (Romolini et al. 2016), and as participating in community partnerships (Shandas and Messer 2008). Locke et al. (2014) found evidence that stewardship can lead to physical land cover change in a New York City study where neighborhoods with increased vegetation had, on average, the presence of more stewardship groups. Community forestry initiatives contribute to

erosion control and shade from extreme heat (Miller et al. 2015). Andersson et al. (2014) found stewards critically important to Stockholm's green infrastructure, but "land-use planning and management seldom account for their role in the generation of urban ecosystem services" (p. 445). Stewardship groups often impact physical planning and engage in "DIY urban planning" (Cloutier et al. 2018). Explained by Carter et al. (2015, p. 1) "Approaches to build adaptive capacity challenge traditional approaches to environmental and spatial planning", and civic stewards take part in this creative process. Stewardship can strengthen place attachment, social cohesion, social networks, and knowledge exchange and diversification -- all indicators of social resilience at the community level (McMillen et al. 2016). Further, working in the context of cascading and compounding crises, such as COVID-19 and systemic racial injustice, civic stewards have been shown to engage in flexibility, learning, and adaptation (Landau et al. 2021).

In their work, civic environmental stewards blend the environmental with the social: "Although concern for the environment remains the primary focus for many civic groups, issues related to ecological restoration and environmental protection have become embedded within larger, quality-of-life concerns for numerous organisations and informal groups representing a wide variety of sectors, scales, geographies and notions of sustainability" (Fisher et al. 2012, p. 28). Agyeman and Angus (2003) refer to groups and projects that reckon with social and economic problems in addition to the ecological as engaging in "broad focus" civic environmentalism. As opposed to scratching the surface of civic participation, "broad focus" work is characterized by power sharing, trust building, and shifting paradigms. This social-environmental understanding of the system is mirrored in recent scholarship on community participation in climate change mitigation planning (Leichenko et al. 2015).

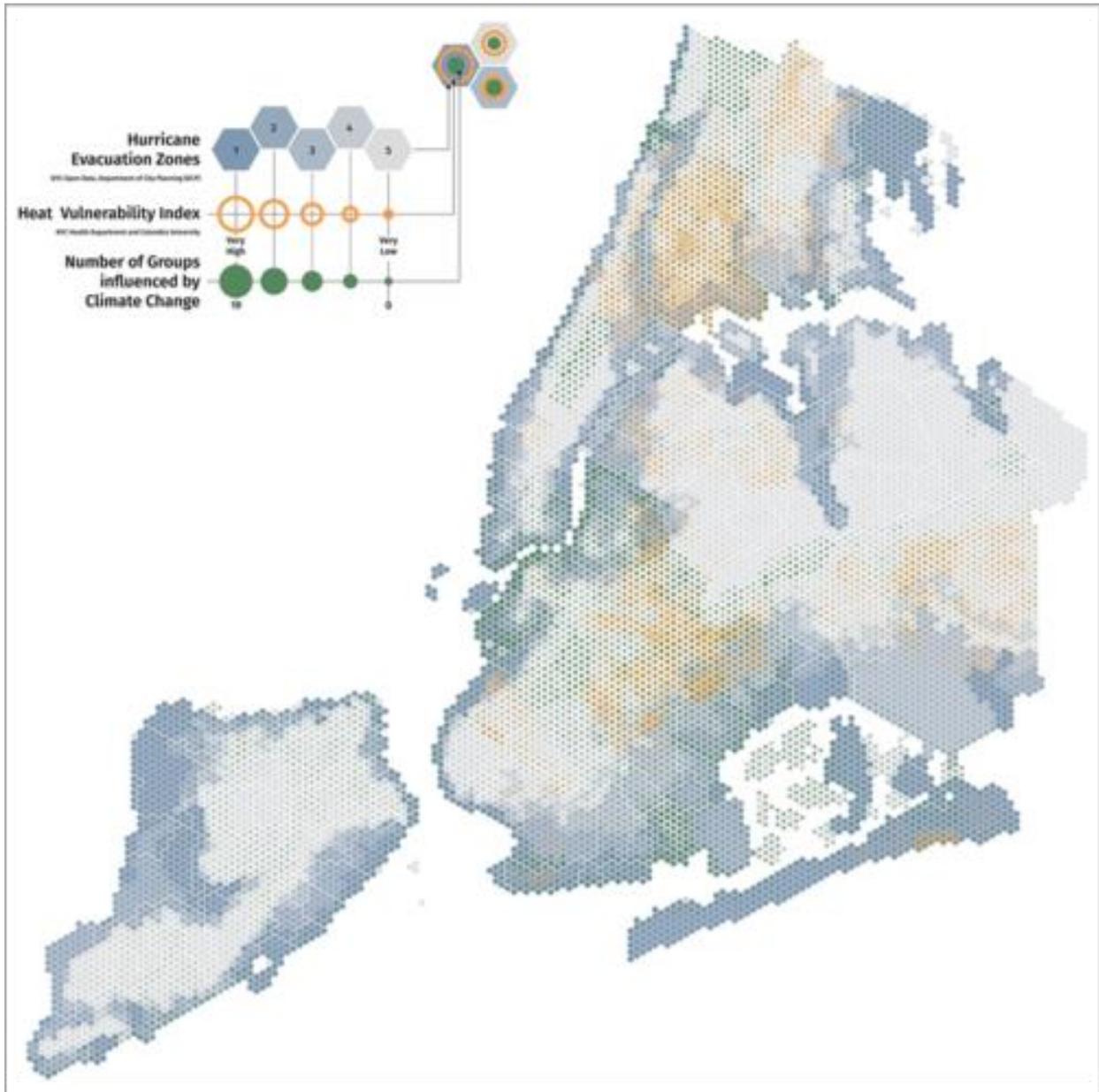
Climate change can be understood as a complex environmental concern that warrants involvement from multiple sectors, including community groups (Folke et al. 2005; Sarzynski 2015). While not all stewardship groups work directly on mitigation or adaptation, stewardship actions—from increasing or improving green space to advocating for city-wide composting—improve urban resilience in the face of climate shocks and stresses (Leichenko 2011). Climate change has also been self-reported as a major influence on stewardship groups practices (Landau et al. 2019). Following Superstorm Sandy, stewardship groups drew from lessons learned about place meaning, inequitable impact, and organizational response to disaster. Some leveraged post-Sandy funding to begin new stewardship and restoration projects that are ongoing today (Landau et al. 2021).

This research aims to capture the contributions of civic environmental stewardship groups to urban environments that bolster transboundary climate adaptation planning efforts and aim to foster sustainable social-ecological systems. As Bennett et al. (2018) advocate for increased scholarship on local stewardship as a means of maintaining the natural environment, we add to this call, acknowledging the work of stewards that impact local environmental and social change. We suggest exploring the work and tactics of civic stewards to better understand how stewards engage in adaptive planning efforts as transboundary actors within urban governance regimes. Here, a focus on civic stewardship strengthens calls for more democratic and collaborative planning by providing a framework that illustrates how members of the public organize to achieve shared goals around improving socio-ecological systems.

## **Methods**

The Stewardship Mapping and Assessment Project (STEW-MAP) was started in 2007 by USDA Forest Service researchers to answer the questions of who takes care of the local

environment in New York City, how these groups influence urban social-ecological systems, and how they engage in collaborative governance networks (Svendsen et al. 2016). STEW-MAP is a survey and interview-based research methodology and set of tools designed to capture the organizational characteristics, geographical territories, and social networks of civic groups that participate in environmental stewardship. Since the first survey in 2007, the project has been replicated and adapted in over 15 locations globally, spanning urban and rural geographies (Svendsen et al. 2016; Landau et al. 2019). In 2017, the survey was repeated in the New York City region, with a total of 7,003 groups in New York City receiving the survey and 754 responses (11% response rate). Figure 1 illustrates this citywide pattern of stewardship territories and prevalent climate issues the city faces, including extreme heat and coastal flood vulnerability. These data illustrate city-specific climate impacts and highlight how civic stewardship groups work in climate-impacted spaces.



**Figure 1.** Patterns of stewardship and climate impacts in New York City: Civic stewardship territories, coastal flooding zones, and high urban heat areas.

Source: Map created by Can Sucuoglu, Pratt Spatial Analysis and Visualization Initiative with Stewardship Mapping and Assessment Project NYC 2017 Data (see also <https://www.thenatureofcities.com/friec/wtcony-2020/> to access an interactive version of this map).

Data for this research come from qualitative interviews conducted in Spring 2019 with a selection of STEW-MAP survey respondent groups, seeking to understand the actions and functions of urban sustainability governance networks. We used stratified random sampling to select civic stewardship groups to participate in in-depth, semi-structured interviews (Robinson 2014). The sampling design considered the size of each group's geographic territory and level of network connectedness, following Connolly et al. (2013) to capture a range of scales and structural locations within governance networks. Groups were selected using a stratification that placed respondents into one of nine buckets based on their geographic territory size (small, mid-size, citywide or larger), and their level of social network connectivity (highly connected, named as a partner, not named as a partner). Three groups from each of those buckets were randomly selected for a total of 27 selected interview groups (see Campbell et al. (2021) for more details on selection methods). Selected groups were invited to participate, and those who declined were replaced with another random selection from their same category until three per category were interviewed or until there were none left in the category. Of the 27 spots, we were able to complete 26 interviews. The interviews were voluntary and confidential, lasted between 60-90 minutes, and sought to understand qualitative details and group history that could not be captured at the survey-level, as well as any changes that occurred between the 2017 survey and the 2019 interview (Rutgers IRB #E17-549). Semi-structured interviews covered a variety of topics including socio-ecological goals, impacts, and outcomes, organizational histories, organizational networks, interaction with existing and planned government policies and programs, and threats or challenges to the group (See Appendix 1 for interview protocol). Using a semi-structured approach, interviews were conversational in nature and followed the focus and emphasis of the groups themselves, using probes and follow-up questions to further elicit linkages to

transboundary urban environmental governance and climate change adaptation as part of a broad suite of strategies and tactics related to stewardship of urban social-ecological systems.

Upon transcribing the recorded interviews, we then coded transcripts for actions that each group took in response to a perceived problem, identifying a set of ‘tactics’, informed by grounded theory methodology (Strauss and Corbin 1994). From these interviews, five roles emerged: shaping physical spaces, brokering partnerships, disrupting the status quo, building civic capacity, and envisioning new futures. Here, we note that each group does not neatly fall into one category or another – depending on their tactics and scales, groups can (and often do) move through and between roles as they engage in transboundary urban governance.

## **Results**

Using the literature as a framework, we identified several roles that stewardship groups play as they work to transform urban environments in the face of climate change (Table 1). While the work of respondent groups varies significantly in terms of scope and impact, the interviews illuminated the capacity of civic stewardship groups through a variety of actions and outcomes. The existence and persistence of these groups reveal a crucial source of local knowledge. These groups have vast potential as community-based partners to planners working in government and the private sector to advance climate adaptation. To demonstrate each role, we highlight a single illustrative case from our interviews. Although we write in detail about five groups as examples of the five roles, each of the 26 groups demonstrated at least one, and more often many, of the 16 identified tactics that shape each role. Quotes that illustrate these tactics are presented in Table A1 (supplementary materials).

**Table 1.** Civic Environmental Stewardship Roles in Urban Socio-Ecological Systems.

Role	Description	Associated tactics	Examples of supporting literature
Shape physical spaces	Impact physical and land use planning, maintenance, and care	<ul style="list-style-type: none"> <li>• Transform sites into green space</li> <li>• Contribute resources, labor, and information to help maintain and manage green space</li> <li>• Advocate for policy change</li> </ul>	<ul style="list-style-type: none"> <li>• Campbell et al. (2021)</li> <li>• Locke et al. (2014)</li> </ul>
Broker partnerships	Build relationships between government bodies and communities	<ul style="list-style-type: none"> <li>• Collaborate to fund projects and community programs</li> <li>• Manage public-private partnerships</li> <li>• Act as liaisons to bridge communities and decision-makers</li> </ul>	<ul style="list-style-type: none"> <li>• Connolly et al. (2014)</li> <li>• Graham and Mitchell (2016)</li> <li>• Enqvist et al. (2018)</li> </ul>
Disrupt the status quo	Build momentum for change in the face of challenges	<ul style="list-style-type: none"> <li>• Organize community to oppose city plans or development</li> <li>• Take legal action against development</li> </ul>	<ul style="list-style-type: none"> <li>• Legacy (2017)</li> <li>• Christmann (2020)</li> </ul>
Build civic capacity	Inspire action and build coalitions between individuals and groups	<ul style="list-style-type: none"> <li>• Bring neighbors together around a shared activity</li> <li>• Facilitate community participation</li> <li>• Forge connections to the natural environment</li> <li>• Educate students and potential stewards</li> </ul>	<ul style="list-style-type: none"> <li>• Fisher, Campbell, and Svendsen (2012)</li> <li>• Agyeman and Angus (2003)</li> <li>• Maclean, Cuthill, and Ross (2014)</li> </ul>
Envision new futures	Imagine new ways of living in the face of climate change, adapting strategies in real time	<ul style="list-style-type: none"> <li>• Develop innovative tools for environmental planning</li> <li>• Outline future-oriented visions</li> <li>• Create pilots and prototypes</li> <li>• Use creative communication methods to discuss challenging and/or taboo environmental issues</li> </ul>	<ul style="list-style-type: none"> <li>• Cloutier, Papin, and Bizier (2018)</li> <li>• Carter et al. (2015)</li> <li>• Jabareen (2015)</li> <li>• Rosa et al. (2021)</li> </ul>

### *Shaping physical spaces*

Stewardship groups contribute significant and direct capacity, labor, and time to the shaping and ongoing maintenance of green spaces. In addition, groups use advocacy to indirectly impact green spaces through plans and policies. Many stewardship groups commit time, personnel (including both paid and unpaid labor), and resources to ongoing care and maintenance that can have long-term benefits to the local environment.

Formed by a small group of individuals in 2008 seeking to combine existing historic districts in the face of development, one civic stewardship group successfully built a coalition that advocated for the Riverside –West End Historic District Extension 1 designated in 2012 in Manhattan. Following completion of their goal, the efforts of the group shifted to focus on the

ongoing beautification and care of their neighborhood, largely through environmental actions such as street tree maintenance. They helped launch the annual “Love Your Street Tree Day,” which now attracts people from all around the city to learn about proper street tree care and take home the necessary supplies to become street tree stewards in their own communities. As current conversations shift toward the impending impacts of climate change, community tree stewardship is one local response that has not only a direct biophysical impact on the performance of the urban forest, but also the potential to inspire further local engagement and action. The street tree stewardship encouraged by Love Your Street Tree Day helps to create more permeable land to both decrease combined sewer overflow (CSO) and absorb excess rainfall (Liu et al. 2014). One group member reflected,

“I can’t individually fix climate change, right... but these little grassroots local efforts, I feel like if enough of them are happening it’s a trickle effect up... and it makes one feel empowered because you...take action and you can see improvements on the very local level and so it is empowering especially when... the environmental challenges seem so overwhelming.” (R27)

This example illustrates a group making a direct impact on the built and biophysical environment with the goal of positive environmental change and community empowerment. While their events are partially framed as a way to improve neighborhood quality of life and even local business performance through beautification, climate change is an essential underlying motivator. The group organizers equally promote the environmental benefits of cleaner air and reduced runoff that come from healthy tree beds. Though the biophysical impacts of these acts are relatively minor in terms of greenhouse gas reductions, their stewardship efforts can also be understood as playing a role in climate change mitigation. These individual actions contribute to

broader patterns of caretaking as stewards share knowledge and resources that ripple throughout communities.

### *Brokering partnerships with government and community residents*

Brokering partnerships is an essential stewardship role as civic groups often act as key boundary spanners in relationships between government and community, or between various community stakeholders. Stewardship groups have a variety of different relationships with government, from independent groups of neighbors to traditional public-private partnerships. Larger and more professionalized stewardship groups often mediate between government agencies that serve as land managers/funders and the constituents for whom those groups serve. Here, ‘brokers’ are defined as being highly connected civic actors that play a bipartite role in the larger governance network (Connolly et al. 2014).

In 2002, one group of civic stewards shifted away from on-the-ground stewardship in community gardens and other public spaces to become a data and research-focused organization. To ensure that their research reaches decision-makers, the group engages in extensive community outreach and advocacy while maintaining a close relationship with government, particularly the New York City Department of Parks and Recreation (NYC Parks). Much of their work focuses on advocating for an increase in the budget for NYC Parks, thus benefiting the government agency. At the same time, the group advocates for New York City residents through projects like their Report Card on Parks, which evaluates and grades parks amenities, pushing on NYC Parks to invest in improvements. This tension and duality of supporting and also pushing back on a government agency is part of what makes a group into a broker (Connolly et al. 2013). This group often plays the role of mediator between the two—bringing the concerns of residents

to NYC Parks and communicating progress and limitations of government progress back to their constituents. The relationship of the stewardship group to the government agency here is as crucial as their relationship to the communities they are serving. This triangle is illustrated well in a 2019 campaign called Play Fair. The campaign, led by the civic stewardship group in partnership with the New York League of Conservation Voters, and DC-37, the Park's Workers Union, secured \$44 million of new funding in the NYC Parks budget. This funding is essential to supporting the ongoing care and maintenance of open space in New York City—space that is vitally important to the city's ability to cope with climate change impacts. Greenspace is a key part of the city's approach to climate resiliency, specifically dealing with flood impacts (NYC Parks 2017). Since NYC Parks, as a mayoral controlled agency, cannot advocate for itself, the civic group sees itself as the voice of the agency as well as the voice of the community members. Being an independent non-profit also allows the group to speak out about the growing concern of the changing climate in New York City. This role of the broker highlights synergies with state planners, underscored by a representative's view of the group as “a wonky planning organization at the end of the day” (R14).

### *Disrupting the status quo*

Civic stewardship often builds momentum for change even in the face of political challenges or moments of tension between government actors and community members. As activists, scientists, and policymakers have come to understand that business-as-usual models will not be enough to avert a climate crisis, groups that disrupt the status quo are essential for pushing boundaries around climate planning practices, ensuring that community voices are

heard. Stewardship groups act as disruptors through community organizing, legal action, guerilla greening (unauthorized planting and care), and movement building.

One STEW-MAP respondent group stands out as disrupting the status quo. The group is a coalition of community gardens in the Lower East Side of Manhattan that advocates for permanent community gardens and increased public green space. The coalition works to unite the whole neighborhood against future garden demolition and responds to other threats to green space in the neighborhood as they arise. As one group member observed, “any green space is sort of sacred in this city ‘cause you’re never going to get it back once it’s gone and we just don’t have very much of it...” (R11).

Currently, one of those perceived threats is the redesign of East River Park, badly damaged in 2012 during Superstorm Sandy. Through the Rebuild by Design Effort (funded by public, civic, and private groups after Superstorm Sandy) city officials identified community groups on the Lower East Side to collaborate on the renovation. In 2018, the city announced that they would scrap the plan resulting from this process and replaced it with a different design and lengthier, pricier, process that would cover the existing park and eventually build another park on top. During that process, the 58 acres of parkland would be closed and covered for at least three years, temporarily cutting off the community’s access to green and open space (Zhao, 2021). The community garden coalition joined other local civic groups to express their frustration through marches and actions. A coalition of community groups spearheaded a lawsuit, East River Park Action (ERPA) et al. v City of New York, citing multiple concerns including the razing of existing green space and the loss of substantial mature tree canopy that would cause increased construction pollution in an area already vulnerable to poor air quality (<https://eastriverparkaction.org/lawsuit>). The petition was denied in 2020, and the denial of

petition was affirmed in 2021, but a phased construction plan was adopted to keep parts of the park open during construction. Construction has since begun, with a goal of completion by 2025. Opponents are skeptical that the construction will finish in time. They worry about the interim impact on the already vulnerable neighboring communities and view the plan as a tool of green gentrification. Others, including some local NYCHA public housing residents, argue that the disruptive tactics of ERPA are delaying necessary flood protection that is too important to challenge (Helmore 2021). While highly contentious, this example shows the potentially conflicting goals of long-term climate protection and continuous community access to vital green space, particularly during the time of capital construction. Still, this case shows the power of community groups to alter construction plans and timelines significantly and to raise key questions about *how* climate adaptation should proceed.

### *Building civic capacity within communities*

Engaging community at the local level is essential to building the civic capacity necessary for effective climate governance. In addition to improving environmental outcomes, stewardship groups activate spaces as social infrastructure, fostering community cohesion and building social networks (Campbell et al. 2021). STEW-MAP interview respondents reflected on a variety of social outcomes, from providing interpersonal interaction for retired residents to teaching civic engagement skills to students. In line with previous scholarship that underscores how stewardship fosters social resilience (McMillen et al. 2016), these relational outcomes compound to build social infrastructure recognized as increasingly important in the face of climate related disasters (Klinenberg 2018).

One group that engages in the stewardship of a New York City parkland was interested in how to best connect to community members to engage them in greening work. As part of a project with Hester Street Collaborative, they developed Park-as-Lab, a research collaborative that uses the natural landscape of the park as a research lab to investigate questions from community members. This project led to the development of a collaborative tool to collect ideas from individuals at community meetings on what they would be interested in learning from the researchers who work on the park. The tool allows them to share a concern or curiosity, which can then be explored by employees and local students. Rather than a training model that instructs stewards on how to care for the environment, Park-as-Lab encourages students and community members to explore their city and ask their own questions to get involved with environmental action. Reflecting on their hopes for the future of stewardship in New York City, one group member commented,

“I would love to see all of us in our own ways begin to take on active stewardship, whether that’s on our block or in our neighborhoods or in our city as a whole to scold and educate our friends and family when we see them littering on the street, to remind people why it’s important not to step in the tree pit, to getting them to want to have more on-the-water access, to want to go into their parks and natural areas and to get them to work together in doing so, to get them to actually build the social community by building this stewardship community.” (R4)

As urban climate governance efforts struggle to achieve robust and sustained civic engagement, Park-as-Lab offers a model for community-led research that could work at many points along the planning process. This kind of community engagement plays a vital role in addressing climate

change by creating pathways for climate education, supporting authentic, community-led inquiry, and promoting environmental action.

### *Envision new futures*

To envision new futures, civic stewardship groups act as creative forces that help imagine urban environmental and social change. This role draws on literature centering participatory foresight, as recent work highlights the importance of future-oriented citizen dialogues to define local goals and priorities (van den Ende et al. 2021; Rosa et al. 2021). Stewardship groups have a unique relationship with the places they steward, bringing local ecological knowledge and insight to the planning process. Even groups that lack the resources or power to implement their ideas often contribute novel insights to the conversation through art, publications, and public programming. Through these efforts, groups contribute to broader “civic narratives” that prioritize and make visible local scale climate adaptation (Cloutier et al. 2018).

One community-based organization working to improve an industrial waterway and Superfund site that separates Brooklyn and Queens, created a complete vision plan in 2018. The resulting 150-page document includes 85 proposed projects to address that support the organization's mission of remediation, restoration, recreation, and resilience. Working with a design firm and another civic stewardship group as partners, this group created a collaborative action plan that responds to community and environmental concerns. A group member explained the future-oriented nature of the vision plan: “Those are long timelines but in 20+ years, what are other ways ... that we want to see improvements around the area aside from just cleaning it” (R12).

Much of their vision plan focuses on climate vulnerability, due in large part to the creek's position within a flood zone. The plan proposes a series of adaptations to help absorb stormwater, reduce the impact of heatwaves, and improve air quality. Unlike government planners, however, this civic stewardship group was not commissioned by an organization with the financial and political resources to make this plan a reality. Instead, they created the plan to push forward future conversations and to offer decision-makers a template for improving the waterway. This is one example in which a civic stewardship group took steps to envision new possible futures, contributing a future-oriented perspective to inform development.

## **Discussion & Conclusion**

This paper illustrates a diverse set of roles that embed civic stewards within urban planning and governance processes. By highlighting these distinct, yet overlapping roles, we illustrate the ways civic stewards are acting and have the capacity to further engage as key players in urban climate governance efforts. As civic stewards 1) shape physical spaces, 2) broker partnerships, 3) disrupt the status quo, 4) build civic capacity, and 5) envision new futures, these groups offer unique contributions that might integrate with the work of government planners to help adapt to growing climate impacts by strengthening participatory processes. Because we only interviewed civic groups, we acknowledge that a limitation of the study is that we do not include other actors in the governance network--neither public agencies nor private sector firms--about their perspectives on the role of and collaboration with civic groups. This remains an area for further research, but we pose that it is still a critical starting point and previously understudied area of research to analyze civic groups' reflections on their own role in governance system

Civic groups that shape physical spaces help to create and maintain green spaces that provide valuable ecological services. Groups that broker partnerships work together with their communities and government entities, typically on a city-wide scale, using collaboration as a tactic to reach their goals. Our interviews highlight groups that play a role in city governance, working directly with NYC Parks—the largest public land manager in the city—to achieve community goals. In building civic capacity, civic stewards leverage their community connections to valuable local knowledge and social capital. Groups that disrupt the status quo play the important role of pushing back on existing projects and plans, and often move boundaries on what government actors and professional planners see as possible. Groups that envision new futures innovate in response to disturbance in real time, often leveraging creativity to imagine and create change in response to urban problems. These roles range from more physical or “hands-on” to more social and ideological, as civic stewards engage in visioning, innovation, and trust-building within their communities. While local-scale, physical changes are necessary to adapt to the intensifying impacts of climate change, it is likely that even in aggregate they will be insufficient to mitigate the climate crisis (Salvia et al. 2021). As scholars look to more transformative pathways, reimagining urban spaces, pushing boundaries, and empowering communities become invaluable roles for stewards.

Here, we return to the potential for civic stewards to push forward urban transformations in the face of climate change. Finn et al. (2019) illustrate how in response to disasters like 2012 Superstorm Sandy, planners “help coordinate among disparate stakeholders, work across professional and jurisdictional silos, and negotiate the complexity of recovery” (p. 3). Civic stewards complement this existing work. We note an important distinction between government planners and civic stewards, as stewards often have greater opportunity, insider knowledge, and

community roots to engage in capacity building and the leveraging of social capital. While often more equipped with funding and political resources than civic groups, government planners might face institutional barriers to innovation (Lachapelle et al. 2003). Civic stewards, on the other hand, might have more freedom from bureaucracy, including opportunities to test out innovative approaches or advocate for policy and funding or to cross defined neighborhood, borough, or city borders to work on broad systems-level issues. We see this specifically as civic stewards engage in disruption of the status quo. This may not take the form of “partnership”, instead highlighting tensions, but is often necessary to reach shared goals. Buijs et al. (2019) describe this relationship between citizens and local governments as “mosaic governance” and argue for its transformative potential in building a “green, just and democratic city” (p. 53). Others have acknowledged conflict in the face of social innovation as often necessary to achieve progress (Christmann 2019).

When working in partnership, government planners and civic stewardship groups are well-positioned to combat climate change by identifying existing synergies between planning goals and existing stewardship efforts, bolstering civic engagement, and sharing knowledge. As experts in the field, planners can translate ideas to action - Stults and Woodruff (2017) caution that climate adaptation plans may face challenges coming to fruition without specific implementation guidance. While civic stewards may draw inspiration from local knowledge, government planners can bolster this with evidence-based guidance and advocacy (Mitchell and Graham 2020).

The roles that civic stewards play in socio-ecological systems build flexibility and adaptiveness into existing governance arrangements (Connolly et al. 2013). While some groups may move between multiple roles and use different tactics depending on the project, others work

more narrowly in a specific role. One thing these groups have in common is their potential to increase social resilience. When stewards get together to improve or defend the spaces they care about, they build social ties that play a key role in responding to environmental change (McMillen et al. 2016). Through their ability to build community trust and cohesion, civic stewards can work to build social capital in ways outside the capacity of government planners. Resilience planning in New York City currently focuses heavily on coastal adaptation and the effects of sea-level rise, but social resilience may be even more critical for adaptation to other climate events, including extreme heat days and precipitation events (Highfield et al. 2014; Berry and Richardson 2016). While this paper focuses on urban climate governance, civic stewards engage in roles that intersect with other community planning efforts.

Through this paper, we aimed to illuminate the roles and tactics through which civic stewards can engage with local government planners to push forward efforts toward climate adaptation and resiliency. By highlighting both tensions and opportunities for partnership between the work of government planners and civic stewards, we suggest that scholars think critically about how we might continue to move beyond “token” models of participatory planning to facilitate coordination, cooperation, and eventually knowledge co-production between communities, stewards, and planners. As climate change presents numerous new problems requiring innovative solutions, civic stewards are essential actors engaged in the work of governance and urban change.

## References

- Agrawal A, Perrin N (2009) Climate adaptation, local institutions and rural livelihoods. *Adapting to climate change: thresholds, values, governance* 350–367
- Agyeman J, Angus B (2003) The Role of Civic Environmentalism in the Pursuit of Sustainable Communities. *Journal of Environmental Planning and Management* 46:345–363.  
<https://doi.org/10.1080/0964056032000096901>
- Allen KM (2006) Community-based disaster preparedness and climate adaptation: local capacity-building in the Philippines. *Disasters* 30:81–101. <https://doi.org/10.1111/j.1467-9523.2006.00308.x>
- Allmendinger P, Tewdwr-Jones M (2005) *Planning Futures: New Directions for Planning Theory*. Routledge
- Andersson E, Barthel S, Borgström S, et al (2014) Reconnecting Cities to the Biosphere: Stewardship of Green Infrastructure and Urban Ecosystem Services. *AMBIO* 43:445–453.  
<https://doi.org/10.1007/s13280-014-0506-y>
- Anguelovski I, Carmin J (2011) Something borrowed, everything new: innovation and institutionalization in urban climate governance. *Current Opinion in Environmental Sustainability* 3:169–175.  
<https://doi.org/10.1016/j.cosust.2010.12.017>
- Arnstein SR (1969) A Ladder Of Citizen Participation. *Journal of the American Institute of Planners* 35:216–224. <https://doi.org/10.1080/01944366908977225>
- Baker I, Peterson A, Brown G, McAlpine C (2012) Local government response to the impacts of climate change: An evaluation of local climate adaptation plans. *Landscape and Urban Planning* 107:127–136. <https://doi.org/10.1016/j.landurbplan.2012.05.009>
- Barton JR, Krellenberg K, Harris JM (2015) Collaborative governance and the challenges of participatory climate change adaptation planning in Santiago de Chile. *Climate and Development* 7:175–184.  
<https://doi.org/10.1080/17565529.2014.934773>
- Bauer A, Steurer R (2014) Innovation in climate adaptation policy: are regional partnerships catalysts or talking shops? *Environmental Politics* 23:818–838
- Bennett NJ, Whitty TS, Finkbeiner E, et al (2018) Environmental Stewardship: A Conceptual Review and Analytical Framework. *Environmental Management* 61:597–614. <https://doi.org/10.1007/s00267-017-0993-2>
- Berry P, Richardson GRA (2016) Approaches for Building Community Resilience to Extreme Heat. In: Steinberg SL, Sprigg WA (eds) *Extreme Weather, Health, and Communities: Interdisciplinary Engagement Strategies*. Springer International Publishing, Cham, pp 351–388
- Broto VC, Macucule DA, Boyd E, et al (2015) Building Collaborative Partnerships for Climate Change Action in Maputo, Mozambique. *Environ Plan A* 47:571–587. <https://doi.org/10.1068/a140070p>
- Buijs A, Hansen R, Van der Jagt S, et al (2019) Mosaic governance for urban green infrastructure: Upscaling active citizenship from a local government perspective. *Urban Forestry & Urban Greening* 40:53–62. <https://doi.org/10.1016/j.ufug.2018.06.011>
- Campbell LK, Landau LF, Johnson ML, Svendsen ES (2019) Civic Stewardship of Urban Ecosystems: Forms of Community Engagement with Landscape and Places. In: M. Chatterjee & K. Svyatets (Eds.), *Environmental Issues and Policy: Exploring Past, Present, and Future Sociological Relations*. Cognella Academic Publishing, San Diego, CA, pp 208–224
- Campbell LK, Svendsen E, Johnson M, Landau L (2021) Activating urban environments as social infrastructure through civic stewardship. *Urban Geography* 0:1–22.  
<https://doi.org/10.1080/02723638.2021.1920129>
- Campbell LK, Svendsen ES (2008) Urban ecological stewardship: understanding the structure, function and network of community-based urban land management. *CATE* 1:1–31.  
<https://doi.org/10.15365/cate.1142008>
- Carter JG, Cavan G, Connelly A, et al (2015) Climate change and the city: Building capacity for urban adaptation. *Progress in Planning* 95:1–66. <https://doi.org/10.1016/j.progress.2013.08.001>

- Chan J, DuBois B, Tidball KG (2015) Refuges of local resilience: Community gardens in post-Sandy New York City. *Urban Forestry & Urban Greening* 14:625–635.  
<https://doi.org/10.1016/j.ufug.2015.06.005>
- Chazdon RL (2020) Creating a culture of caretaking through restoring ecosystems and landscapes. *One Earth* 3:653–656. <https://doi.org/10.1016/j.oneear.2020.11.010>
- Christiansen LD (2015) The Timing and Aesthetics of Public Engagement: Insights from an Urban Street Transformation Initiative. *Journal of Planning Education and Research* 35:455–470.  
<https://doi.org/10.1177/0739456X15597037>
- Christmann GB (2019) Introduction: struggling with innovations. *Social innovations and conflicts in urban development and planning. European Planning Studies* 0:1–11.  
<https://doi.org/10.1080/09654313.2019.1639396>
- Cloutier G, Papin M, Bizier C (2018) Do-it-yourself (DIY) adaptation: Civic initiatives as drivers to address climate change at the urban scale. *Cities* 74:284–291.  
<https://doi.org/10.1016/j.cities.2017.12.018>
- Compas E (2012) “Retooling” for the New West: Environmental NGOs, Planning, and Governance Regimes. *Society & Natural Resources* 25:883–899.  
<https://doi.org/10.1080/08941920.2011.642460>
- Connolly JJ, Svendsen ES, Fisher DR, Campbell LK (2013) Organizing urban ecosystem services through environmental stewardship governance in New York City. *Landscape and Urban Planning* 109:76–84. <https://doi.org/10.1016/j.landurbplan.2012.07.001>
- Connolly JJT, Svendsen ES, Fisher DR, Campbell LK (2014) Networked governance and the management of ecosystem services: The case of urban environmental stewardship in New York City. *Ecosystem Services* 10:187–194. <https://doi.org/10.1016/j.ecoser.2014.08.005>
- Doherty M, Klima K, Hellmann JJ (2016) Climate change in the urban environment: Advancing, measuring and achieving resiliency. *Environmental Science & Policy* 66:310–313.  
<https://doi.org/10.1016/j.envsci.2016.09.001>
- Enqvist JP, West S, Masterson VA, et al (2018) Stewardship as a boundary object for sustainability research: Linking care, knowledge and agency. *Landscape and Urban Planning* 179:17–37.  
<https://doi.org/10.1016/j.landurbplan.2018.07.005>
- Fang L, Ewing R (2020) Tracking Our Footsteps. *Journal of the American Planning Association* 86:470–480. <https://doi.org/10.1080/01944363.2020.1766994>
- Field CB (2014) *Climate Change 2014 – Impacts, Adaptation and Vulnerability: Regional Aspects*. Cambridge University Press
- Finn D, Chandrasekhar D, Xiao Y (2019) A Region Recovers: Planning for Resilience after Superstorm Sandy. *Journal of Planning Education and Research* 0739456X19864145.  
<https://doi.org/10.1177/0739456X19864145>
- Fischer F (2009) *Democracy and Expertise: Reorienting Policy Inquiry*. OUP Oxford
- Fisher DR, Campbell LK, Svendsen ES (2012) The organisational structure of urban environmental stewardship. *Environmental Politics* 21:26–48. <https://doi.org/10.1080/09644016.2011.643367>
- Flyen C, Hauge ÅL, Almås A-J, Godbolt ÅL (2018) Municipal collaborative planning boosting climate resilience in the built environment. *International Journal of Disaster Resilience in the Built Environment*. <https://doi.org/10.1108/IJDRBE-10-2016-0042>
- Folke C, Hahn T, Olsson P, Norberg J (2005) Adaptive Governance of Social-Ecological Systems. *Annual Review of Environment and Resources* 30:441–473.  
<https://doi.org/10.1146/annurev.energy.30.050504.144511>
- Graham A, Mitchell CL (2016) The role of boundary organizations in climate change adaptation from the perspective of municipal practitioners. *Climatic Change* 139:381–395.  
<https://doi.org/10.1007/s10584-016-1799-6>

- Harman BP, Taylor BM, Lane MB (2015) Urban partnerships and climate adaptation: challenges and opportunities. *Current Opinion in Environmental Sustainability* 12:74–79.  
<https://doi.org/10.1016/j.cosust.2014.11.001>
- Healey P (1997) *Collaborative Planning: Shaping Places in Fragmented Societies*. Macmillan International Higher Education
- Helmore E (2021) The battle over a vast New York park: is this climate resilience or capitalism? *The Guardian*
- Highfield WE, Peacock WG, Van Zandt S (2014) Mitigation Planning: Why Hazard Exposure, Structural Vulnerability, and Social Vulnerability Matter. *Journal of Planning Education and Research* 34:287–300. <https://doi.org/10.1177/0739456X14531828>
- Hum T (2010) Planning in Neighborhoods with Multiple Publics: Opportunities and Challenges for Community-Based Nonprofit Organizations. *Journal of Planning Education and Research* 29:461–477. <https://doi.org/10.1177/0739456X10368700>
- Irvin RA, Stansbury J (2004) Citizen Participation in Decision Making: Is It Worth the Effort? *Public Administration Review* 64:55–65. <https://doi.org/10.1111/j.1540-6210.2004.00346.x>
- Jabareen Y (2015) *The Risk City: Cities Countering Climate Change: Emerging Planning Theories and Practices around the World*. Springer Netherlands
- Kasymova J, Gaynor TS (2014) Effective Citizen Participation in Environmental Issues: What Can Local Governments Learn? *State and Local Government Review* 46:138–145.  
<https://doi.org/10.1177/0160323X14541549>
- Keenan JM (2018) Types and forms of resilience in local planning in the U.S.: Who does what? *Environmental Science & Policy* 88:116–123. <https://doi.org/10.1016/j.envsci.2018.06.015>
- Klinenberg E (2018) *Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life*. Crown/Archetype
- Krinsky J, Simonet M (2012) Servitude and Volunteer Work: The Political Exploitation of Invisible Labor in New York City Parks. *Sociétés contemporaines* No 87:49–74
- Lachapelle PR, McCool SF, Patterson ME (2003) Barriers to Effective Natural Resource Planning in a “Messy” World. *Society & Natural Resources* 16:473–490.  
<https://doi.org/10.1080/08941920309151>
- Landau L, Campbell LK, Johnson M, et al (2019) STEW-MAP in the New York City region: survey results of the Stewardship Mapping and Assessment Project. <https://doi.org/10.2737/NRS-GTR-189>
- Landau LF, Campbell LK, Svendsen ES, Johnson ML (2021) Building Adaptive Capacity Through Civic Environmental Stewardship: Responding to COVID-19 Alongside Compounding and Concurrent Crises. *Frontiers in Sustainable Cities* 115
- Legacy C (2017) Is there a crisis of participatory planning? *Planning Theory* 16:425–442.  
<https://doi.org/10.1177/1473095216667433>
- Leichenko R (2011) Climate change and urban resilience. *Current Opinion in Environmental Sustainability* 3:164–168. <https://doi.org/10.1016/j.cosust.2010.12.014>
- Leichenko R, McDermott M, Bezborodko E (2015) Barriers, Limits and Limitations to Resilience. *J of Extr Even* 02:1550002. <https://doi.org/10.1142/S2345737615500025>
- Liu W, Chen W, Peng C (2014) Assessing the effectiveness of green infrastructures on urban flooding reduction: A community scale study. *Ecological Modelling* 291:6–14.  
<https://doi.org/10.1016/j.ecolmodel.2014.07.012>
- Locke DH, King KL, Svendsen ES, et al (2014) Urban environmental stewardship and changes in vegetative cover and building footprint in New York City neighborhoods (2000–2010). *J Environ Stud Sci* 4:250–262. <https://doi.org/10.1007/s13412-014-0176-x>
- Lord A, Mair M, Sturzaker J, Jones P (2017) ‘The planners’ dream goes wrong?’ Questioning citizen-centred planning. *Local Government Studies* 43:344–363.  
<https://doi.org/10.1080/03003930.2017.1288618>

- Macaraig JMR (2015) Citizen Science and Greenspace Planning in the Rouge River Watershed. *Journal of Environmental Policy & Planning* 17:435–451. <https://doi.org/10.1080/1523908X.2014.965808>
- Maclean K, Cuthill M, Ross H (2014) Six attributes of social resilience. *Journal of Environmental Planning and Management* 57:144–156. <https://doi.org/10.1080/09640568.2013.763774>
- Mason RJ (2007) *Collaborative Land Use Management: The Quieter Revolution in Place-Based Planning*. Rowman & Littlefield Publishers
- McMillen H, Campbell LK, Svendsen ES, Reynolds R (2016) Recognizing stewardship practices as indicators of social resilience: In living memorials and in a community garden. *Sustainability* 8:775
- Meerow S, Woodruff SC (2020) Seven Principles of Strong Climate Change Planning. *Journal of the American Planning Association* 86:39–46. <https://doi.org/10.1080/01944363.2019.1652108>
- Miller RW, Hauer RJ, Werner LP (2015) *Urban Forestry: Planning and Managing Urban Greenspaces*, Third Edition. Waveland Press
- Mitchell CL, Graham A (2020) Evidence-Based Advocacy for Municipal Climate Change Action. *Journal of Planning Education and Research* 40:31–43. <https://doi.org/10.1177/0739456X17740939>
- Newman G, Shi T, Yao Z, et al (2020) Citizen Science-Informed Community Master Planning: Land Use and Built Environment Changes to Increase Flood Resilience and Decrease Contaminant Exposure. *International Journal of Environmental Research and Public Health* 17:486. <https://doi.org/10.3390/ijerph17020486>
- NYC Parks (2017) *Design and Planning for Flood Resiliency: Guidelines for NYC Parks*. New York, NY, USA
- Pauw WP, Chan M (2018) Multistakeholder partnerships for adaptation: the role of micro, small and medium enterprises
- Reckien D, Salvia M, Heidrich O, et al (2018) How are cities planning to respond to climate change? Assessment of local climate plans from 885 cities in the EU-28. *Journal of Cleaner Production* 191:207–219. <https://doi.org/10.1016/j.jclepro.2018.03.220>
- Robinson OC (2014) *Sampling in Interview-Based Qualitative Research: A Theoretical and Practical Guide*. *Qualitative Research in Psychology* 11:25–41. <https://doi.org/10.1080/14780887.2013.801543>
- Romolini M, Bixler RP, Grove JM (2016) A Social-Ecological Framework for Urban Stewardship Network Research to Promote Sustainable and Resilient Cities. *Sustainability* 8:956. <https://doi.org/10.3390/su8090956>
- Rosa AB, Kimpeler S, Schirrmeister E, Warnke P (2021) Participatory foresight and reflexive innovation: setting policy goals and developing strategies in a bottom-up, mission-oriented, sustainable way. *Eur J Futures Res* 9:2. <https://doi.org/10.1186/s40309-021-00171-6>
- Rosol M (2012) Community Volunteering as Neoliberal Strategy? Green Space Production in Berlin. *Antipode* 44:239–257. <https://doi.org/10.1111/j.1467-8330.2011.00861.x>
- Rudge K (2021) Participatory climate adaptation planning in New York City: Analyzing the role of community-based organizations. *Urban Climate* 40:101018. <https://doi.org/10.1016/j.uclim.2021.101018>
- Salvia M, Reckien D, Pietrapertosa F, et al (2021) Will climate mitigation ambitions lead to carbon neutrality? An analysis of the local-level plans of 327 cities in the EU. *Renewable and Sustainable Energy Reviews* 135:110253. <https://doi.org/10.1016/j.rser.2020.110253>
- Sarzynski A (2015) Public participation, civic capacity, and climate change adaptation in cities. *Urban Climate* 14:52–67. <https://doi.org/10.1016/j.uclim.2015.08.002>
- Shandas V, Messer WB (2008) Fostering Green Communities Through Civic Engagement: Community-Based Environmental Stewardship in the Portland Area. *Journal of the American Planning Association* 74:408–418. <https://doi.org/10.1080/01944360802291265>

- Shi L, Chu E, Debats J (2015) Explaining Progress in Climate Adaptation Planning Across 156 U.S. Municipalities. *Journal of the American Planning Association* 81:191–202. <https://doi.org/10.1080/01944363.2015.1074526>
- Simon K, Diprose G, Thomas AC (2020) Community-led initiatives for climate adaptation and mitigation. *Kōtuitui: New Zealand Journal of Social Sciences Online* 15:93–105. <https://doi.org/10.1080/1177083X.2019.1652659>
- Sternlieb F, Bixler RP, Huber-Stearns H, Huayhuaca C (2013) A question of fit: Reflections on boundaries, organizations and social–ecological systems. *Journal of Environmental Management* 130:117–125. <https://doi.org/10.1016/j.jenvman.2013.08.053>
- Strauss A, Corbin J (1994) Grounded theory methodology: An overview. In: *Handbook of qualitative research*. Sage Publications, Inc, Thousand Oaks, CA, US, pp 273–285
- Stults M, Woodruff SC (2017) Looking under the hood of local adaptation plans: shedding light on the actions prioritized to build local resilience to climate change. *Mitig Adapt Strateg Glob Change* 22:1249–1279. <https://doi.org/10.1007/s11027-016-9725-9>
- Svendsen ES, Campbell LK (2010) Living Memorials: Understanding the Social Meanings of Community-Based Memorials to September 11, 2001. *Environment and Behavior* 42:318–334. <https://doi.org/10.1177/0013916510361871>
- Svendsen ES, Campbell LK, Fisher DR, et al (2016) Stewardship mapping and assessment project: a framework for understanding community-based environmental stewardship. <https://doi.org/10.2737/NRS-GTR-156>
- Takahashi LM, Smutny G (2001) Collaboration among Small, Community-Based Organizations: Strategies and Challenges in Turbulent Environments. *Journal of Planning Education and Research* 21:141–153. <https://doi.org/10.1177/0739456X0102100203>
- Tidball KG, Krasny ME (2014) Introduction: Greening in the Red Zone. In: Tidball KG, Krasny ME (eds) *Greening in the Red Zone: Disaster, Resilience and Community Greening*. Springer Netherlands, Dordrecht, pp 3–24
- van den Ende MA, Wardekker JA, Mees HLP, et al (2021) Towards a climate-resilient future together. A toolbox with participatory foresight methods, tools and examples from climate and food governance
- Wamsler C, Alkan-Olsson J, Björn H, et al (2020) Beyond participation: when citizen engagement leads to undesirable outcomes for nature-based solutions and climate change adaptation. *Climatic Change* 158:235–254. <https://doi.org/10.1007/s10584-019-02557-9>
- Woodruff SC, Meerow S, Stults M, Wilkins C (2018) Adaptation to Resilience Planning: Alternative Pathways to Prepare for Climate Change. *Journal of Planning Education and Research* 0739456X18801057. <https://doi.org/10.1177/0739456X18801057>