

Toward the Next Mode of Practice for Climate Urbanism: Understanding and Preventing Greening-Induced Displacement

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Abstract

The contemporary practice of green climate urbanism faces an acute challenge. Even as the capacity grows in cities to implement increased green climate mitigation and adaptation measures, so does the extent to which such measures become integrated with processes that can threaten the ability of residents to remain in their home neighborhoods. As a result of this entanglement, leading voices within communities that have long been advocates of urban greening are questioning their alliance and complicating the politics of implementation. In order to think toward the next mode of practice for green climate urbanism with this rising conflict in mind, this report lays out the state of research on the socio-spatial dynamics that characterize and drive "green gentrification," and examines what those dynamics mean for climate action in cities.

After initially setting the context for understanding urban greening within climate action, we show why some authors argue that the urban greening-gentrification relationship is intensifying through time, even though this relationship is uneven, nuanced, and contingent upon contextual factors. We further highlight the perverse outcomes that the greening-gentrification relationship portends for climate planning. It points toward increasing inequities in the distribution of climate risk reduction benefits from greening, despite programs with the opposite intention. We build our analysis on a variety of quantitative, qualitative, and mixed-method studies at the city-wide and neighborhood levels, mostly in the United States.

We also identify what the greening and gentrification relationship means in terms of displacement, which particularly impacts the efficacy of place-based climate actions seeking to reduce risk for a given population based on the assumption that the population will remain. Our focus is on the diversity of exclusion and types of displacement that green gentrification potentially signals, highlighting those effects that most impact historically vulnerable groups in the city – particularly those already experiencing a legacy of unequal urban development and segregation. We further suggest a new form of practice for green climate urbanism that internalizes the goal of greening without displacement by (1) avoiding opportunistic implementation of greening based on one-dimensional goals through transversal governance that bridges diverse agencies and community voices; (2) incorporating a wide view of benefits and disbenefits that accounts for social equity implications; and (3) serving as a lever for change from the status quo in areas receiving green climate interventions.



Boston Harbor Green Redevelopment, Lopresti Park (Alberto Bougleux and Barcelona Lab for Urban Environmental Justice and Sustainability, 2021)

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Understanding and Preventing Greening-Induced Displacement

Research Motivation

Climate change is a looming, wicked problem generating particularly acute hazards for the global majority living in urban areas. In response, urban planners are increasingly on the front-line of climate mitigation and adaptation measures that seek to ensure wellbeing for all residents, while also improving overall livability and preserving ecosystems in cities. Urban greening initiatives that seek to reduce the ecological impact of urbanization through a range of initiatives including public green spaces; more efficient building practices; ecosystem-based stormwater management; active transportation infrastructure; and renewable energy are vital aspects of these front-line measures. Indeed, these initiatives provide broad benefits for individual health and wellbeing (Triguero-Mas et al. 2015), ecological functioning (Veerkamp et al. 2021), economic growth (Łaszkiewicz 2023), and civil society (Fisher et al. 2015).

Yet, the benefits of urban greening can subvert attention away from the negative impacts of economic growth initiatives on climate change. Neither the positive nor negative impacts of green urban growth initiatives are distributed equally, and those who are most vulnerable to the effects of climate change do not necessarily have the tools to hold onto these benefits when they are generated in cities. This crucial point complicates the "green is good" orthodoxy that sometimes characterizes the practice of green climate urbanism (Angelo 2019; Connolly 2019). As a matter of political pragmatism, this field of practice tends to generate a win-win narrative that enables greening to be more easily mainstreamed into urban development. However, while this mainstreaming trend may generate more visible support for greening in cities, it also runs the risk of ignoring an important undercurrent being felt by an increasing number of residents.

Indeed, recent research on demographic trends and the lived experience of residents indicates that urban greening is often associated with processes of gentrification that generate pressures for displacement of long-time, working class, minority, and racialized residents. Increasingly, we see that these residents have reservations about new green (re)development due to the fear that it will bring with it a new neighborhood dynamic and pace of change with which they simply cannot financially, emotionally, or culturally keep up. This changing dynamic often reflects social, cultural, and/or economic push factors generated by gentrification in cities that may become linked with displacement from home, neighborhood, and community.

The links between greening and gentrification are complicated, and gentrification generates a variety of pressures that may or may not lead to physical displacement. Still, there is a clear perception and growing observable reality wherein **greening is not just about reducing risk in cities, but also about reordering the spatial distribution of those exposed to risk in urban regions**. For some, this sense of shifting and compounding risk, rather than risk reduction, is what is primarily perceived. More specifically, some historically marginalized groups living in cities do not perceive green climate actions as helpful because they do not address the risks that they prioritize. Some actions also end up multiplying the risks they face: double displacement due to affordability and unmet climate change threats against their homes and families. As a result, they

are at least culturally, if not physically displaced within a process that leaves them with little option but to be increasingly segregated from the benefits of greening, often to greyer and more climateexposed neighborhoods.

This process, termed green gentrification by scholars in urban planning, ecology, sociology, and geography, is a paradox lying underneath the practice of green climate urbanism. However, it is not invisible. It is growing to become a common discourse as major public news outlets especially in the United States such as PBS NewsHour¹, National Public Radio, Bloomberg, and Al Jazeera² have all featured stories of American and international cases. Public officials and planners in cities such as Boston, Seattle, San Francisco, Barcelona, Nantes, and Dublin are commenting on green gentrification in their campaigns and urban plans and, in turn, calling for an accounting within municipal actions for the intricate relation between greening, land and real estate speculation, and displacement of vulnerable residents.

Meanwhile, scholars have aimed to parse out the contexts, characterizations, dynamics, and implications of urban greening as a process using a variety of neighborhood and city-wide analyses. Research is growing in spatial and temporal specificity as well as in methodological and geographical diversity. New knowledge is also being developed on the process of green gentrification itself and on the types of displacement, loss, and socio-cultural impacts involved.

In this report, we lay out this emerging landscape of knowledge with the goal of highlighting where areas for intervention and greater understanding exist for those pushing forward a practice of green climate urbanism. We particularly highlight what emerging practice is happening now that attempts to bridge this scholarly work with planning and policy actions. Most importantly, we seek to synthesize the available information into a format that makes visible the pathways wherein a new form of practice in green climate urbanism might start to take shape.

This new form of practice at once internalizes the mainstream narrative of widespread benefits from green climate urbanism and the emerging counter-narrative of the reordering of exposure to climate risk that also comes with green climate urbanism. It is also increasingly responding to the latest social justice concerns expressed by environmental justice and community development groups. Indeed, current practice has leveraged the mainstream narrative to accomplish a lot, but a new form of this practice is now needed if it is to advance beyond its current limitations. Without such advancement, the political support for green climate urbanism will erode under the weight of the counternarrative.

¹<u>https://www.pbs.org/newshour/show/how-green-gentrification-is-pricing-out-longtime-east-boston-residents;</u> <u>https://the1a.org/segments/can-cities-go-green-without-driving-gentrification/;</u>

² <u>https://www.bloomberg.com/news/features/2022-11-10/a-challenge-for-cities-going-green-without-the-gentrification; https://www.aljazeera.com/program/all-hail/2022/12/15/theres-a-mega-climate-problem-with-our-megacities-all-hail</u>



Anacostia River waterfront park – Washington DC, a park under redevelopment in the historically segregated neighborhood of Anacostia (Alberto Bougleux and Barcelona Lab for Urban Environmental Justice and Sustainability, 2021)

Greening As a Tool in Climate Planning

Urban greening is a tool for climate planning in the sense that it embodies efforts to reduce the ecological impacts of urban development, and, in the process, to mitigate and adapt to climate change. Urban greening has been operationalized in the literature in a number of ways, ranging from generalized and comprehensive definitions to narrow and specialized uses of the term. On the one hand, urban greening has been understood broadly as "a proliferation of urban quality of life and environmental sustainability initiatives" (Angelo 2019), including actions linked to green energy and sustainable transport planning. On the other hand, urban greening has also been used more specifically to refer to concrete elements of the built environment, such as physical urban green spaces including parks, gardens, greenways, playgrounds, green roofs, urban canopies, farmers' markets, LEED certified buildings, and other physical climate resilient infrastructure (Angelo 2019; De Sousa 2014; Du and Zhang 2020). In environmental, conservation, and ecology discourses, green climate interventions often fall into the wider category of nature-based solutions (NBS), which propose ways of solving problems that leverage any aspect of nature (Escobedo et al. 2019; Kotsila et al. 2020). NBS often manifest as green infrastructure (GI) and are underpinned by growing public and funding interests around the multi-functionality of urban greening (Kotsila et al 2020).

In this report, we mostly use the **generalized definition of urban greening**, although we largely leave aside energy and transport initiatives to focus more specifically on the findings around green infrastructure. Unless stated otherwise, when we say urban greening, we refer to the notion of general reductions in ecological impact from urban development that result in improvements to urban sustainability and quality of life, and support climate mitigation and adaptation. Yet, we do also utilize research results that are rooted in a more specific meaning of urban greening as a reference to a given element of the built environment. Thus, in this report, we mostly use an inclusive definition of urban greening but shift sometimes to a more specific understanding of the term, indicating when we do so.

Research has demonstrated that **urban greening**, **understood broadly**, **has important environmental and ecological benefits**, **while also servicing significant health and well-being**, **social**, **and cultural co-benefits** (Dadvand et al. 2018; Gascon et al. 2015; D. Kim and Song 2019; Triguero-Mas et al. 2015; Veerkamp et al. 2021). Of the environmental and ecological benefits, often referred to as ecosystem services, urban greening has been demonstrated to improve urban air quality, urban water quality, heat regulation, noise reduction, flooding and rainwater drainage, water supply, wastewater treatment, carbon sequestration, and more (Bellezoni et al. 2021; Breuste et al. 2013; Collier et al. 2023; Jayasooriya et al. 2017; Lazaro et al. 2022; L. Rice 2020; Wamsler et al. 2020). Urban greening provides critical physical health benefits by promoting physical activity as well as mental health benefits by reducing stress and anxiety, improving sleep and quality of life, and providing opportunity for social inclusion and community ties (Cohen-Cline, Turkheimer, and Duncan 2015; Coventry et al. 2015).

Urban greening is also known to provide social services, such as enhanced sense of community, communication, place, belonging, and identity (Anguelovski 2014; Hosseini et al. 2021; Loder 2020; Oscilowicz et al. 2020; Planas-Carbonell et al. 2023; Raymond, Stedman, and Frantzeskaki 2023; K. M. Smith 2011). Additionally, urban greening has demonstrated its role in enriching cultural services and values, including offering space for recreational and creative opportunities, landscapes of culture-specific beauty, and intellectual reprieve (Kosanic and Petzold 2020; Nesbitt et al. 2017; Riechers, Barkmann, and Tscharntke 2018). Green spaces are particularly important resources and refuges for women (Calderon-Argelich et al. 2023) and minorities and immigrants due to their public nature and opportunity for social encounter particularly when in close proximity to homes, even though those groups often report safety and trust concerns and experiences of gender, ethno-racial, and nativist exclusion in green areas (Fernández Nuñez 2022a, b, Mullenbach et al. 2021, Byrne 2012).

Climate change experts including the Intergovernmental Panel on Climate Change (IPCC) recognize the population benefits and environmental services of urban greening and urban green spaces, calling for standardizations and prioritization of both in planning practice as critical adaptation and mitigation tools for addressing climate change (Ali et al. 2022). Moreover, planners commonly recognize that urban greening and urban green spaces could serve as an actual solution to climate vulnerability and environmental degradation while supporting a community's sense of place and improving livability (Meerow, 2020, Meerow and Keith, 2022). Yet, it is also commonly

understood that urban greening within climate mitigation and adaptation is not 'neutral' and instead is accessed, developed, and implemented inequitably (Shokry et al, 2020).

A legacy of inequity underlies the effects of urban green planning and stems from discriminatory housing and race-based, segregation-driven land use policies such as those that led to the location of low-income, racial/ethnic minorities in undesirable areas near landfills, highways, or industrial sites while simultaneously positioning high profile urban green spaces in whiter, higher-income neighborhoods (Anguelovski, Ranganathan, and Hyra 2021; Connolly and Anguelovski 2021; Klompmaker et al. 2023; Alessandro Rigolon and Németh 2021). The US specifically is characterized by concurrent residential segregation and unequal historic investment in parks, recreational areas, and tree planting – and their maintenance – in minority neighborhoods (Connolly and Anguelovski 2021).

Recognizing this legacy of racism in planning practice and unequal access to greening for lowerincome and minority neighborhoods, many municipalities and nonprofits have shifted their lens of focus to consider the racial and social context in comprehensive plans with the aim of prioritizing equity in comprehensive (green) planning (Chu and Cannon 2021; Schrock, Bassett, and Green 2015). For example, many cities have sought to ensure that all residents are within a short walk of a public green space and some cities have worked to bring funding equity across green spaces. Los Angeles is one such example, where planners are building on an existing greenspace (in)equity index to support funding prioritization and "close the equity gap in access to open space" (National Recreation and Park Association 2022).

Despite this cultural and professional shift toward inclusivity and equity when implementing urban greening, low-income, racialized and vulnerable residents still face compounded challenges whereby urban greening and green spaces remain inaccessible in many neighborhoods across the US, as pointed out by diverse public and nonprofit studies (National Recreation and Park Association 2022; ParkScore® Scoring Metrics 2022) while (re)developed urban green spaces and amenities are eliciting new mechanisms of inequity through displacement and exclusion through green gentrification. While planners aim to provide the social and environmental benefits known to be associated with urban greening and green space, green gentrification and the observed and potential green displacement that follows challenge this ideal. Today's planners in practice are now recognizing this new paradigm, for which scholars and researchers aim to provide the knowledge and tools that can deliver proactive remediation and just, inclusive solutions.



Cully Neighborhood Community-developed Park – Cully Park, Portland, Oregon (Alberto Bougleux and Barcelona Lab for Urban Environmental Justice and Sustainability, 2021)

What Have We Learned about Greening and Gentrification?

What is gentrification and when did greening become involved?

Gentrification has been defined as a process in which the **influx of capital transforms an urban neighborhood socially, economically, culturally, physically, and demographically** (Brown-Saracino 2009; Curran 2004; Davidson 2007; Fullilove 1996). The term gentrification first appeared in the literature following an ethnographic study of displacement of the working-class by the middle-class in London (Glass 1964). Since then, scholars have identified many forms and processes of gentrification, which share common outcomes of landscape change, social upgrade by high-income in-movers, and displacement of low-income groups.

Green gentrification is a subset within the broader dynamics of environmental and green injustices, which can be traced back to the American environmental justice movement from the 1980s through the 2000s. During that time, scholars and activists gave a name to environmental racism, thereby recognizing the inequitable distributions of toxic sites and hazardous land uses on people of color across the country (Bullard 1994; Chavis and Lee 1987) and calling for the consideration of race, ethnicity, and socioeconomic power in sustainability practices (Agyeman

2008; Agyeman et al. 2016). One response to these inequities was to generate grassroots greening within environmental justice neighborhoods, transforming derelict land, brownfields, and unused or underused parcels into parks, playgrounds, and community gardens, among others (Alkon and Agyeman 2011; Anguelovski 2014). However, as these greening initiatives became seen as essential amenities for younger and more affluent residents that were part of the "back-to-the-city" movement (Hyra 2015), they began to take on a changed meaning for neighborhoods. Eventually, the popularity of urban greening led to scaled-up initiatives embedded in municipal economic growth strategies that were then attached to large-scale redevelopments. This circumstance raised questions beginning in the late 2000s about who was actually benefitting.

What do we mean by green gentrification?

Green gentrification is part of an evolving discourse. The precursor term "ecological gentrification" was first coined by urban planning scholar Sarah Dooling as a characterization of what she saw happening around the removal of homeless encampments, especially those in public parks. For Dooling, ecological gentrification was "the implementation of an environmental planning agenda related to public green spaces that leads to the displacement or exclusion of the most economically vulnerable human population while espousing an environmental ethic" (Dooling 2009). "Environmental gentrification" was developed as a concept shortly thereafter to describe the process of repurposing brownfield sites into high-end developments (Banzhaf 2012; Checker 2011; Sieg et al. 2004). By the mid-2010s, the broader moniker of "green gentrification" became a common term for discourse amongst researchers seeking to capture a more **generalized relationship between greening and the threatened rights of vulnerable people to occupy and live in urban space** – still not far from the original intent expressed by Dooling, but looking at a broader spectrum of social vulnerability status by race, class, and ethnicity than just that occupied by the unhoused.

Green gentrification highlights moments when the "creation or restoration of an environmental amenity" serves as the catalytic spark toward gentrification that often creates pressures for displacement when combined with real estate speculation and development (Gould and Lewis 2016). Since its initial usage, green gentrification has come to refer to instances wherein greening plays a causal role in bringing about gentrification because it is a primary attractor for gentrifiers. To broaden this view a bit, it is the process whereby greening becomes enmeshed in gentrification as it unfolds because it sparks early interest in an area and because it becomes one means by which gentrifiers visibly "claim" an area by visibly branding it with their cultural preferences. In the latest development of this discourse, beginning in late 2010s, climate gentrification has emerged as a related critique of municipal climate action plans as well as pre/post-disaster adaptation strategies (S. K. Kim and Park 2023; Planas-Carbonell et al. 2023; J. L. Rice et al. 2020; Shokry, Anguelovski, and Connolly 2018; Shokry, Connolly, and Anguelovski 2020).

The relationship between gentrification and displacement has long been a central concern within this literature and more broadly in studies rooted in geography and sociology. A full understanding of this relationship is still being integrated into the green gentrification discourse. Early studies of gentrification in North America and Europe were almost entirely conducted at a local and comparative case-study level, providing evidence of the on-the-ground experiences of residents and the displacement pressures they faced. More recent studies have examined the extent to which displacement always follows gentrification (Easton et al. 2020), centering on processes such as "unhoming" (Elliott-Cooper, Hubbard, and Lees 2020) as well as "root shock," violence, and trauma (Fullilove 1996), which gentrification often entails. Scholars have also theorized green gentrification beyond the local level, expanding it to consider the global contexts and patterns linking gentrification with displacement through trends of capital and land extraction as well as unequal urban development and revitalization (Anguelovski et al. 2022; Campello Torres and Jacobi 2021). This emerging trend links green gentrification with the broad macro-economic pressures for displacement expressed within the global or planetary gentrification literature (Lees, Shin, and López-Morales 2016; N. Smith 2002).

Expanding upon the early rent gap theory developed to explain foundational motivations for gentrification (Smith 1987), green gentrification scholars have theorized a market-led process of **'urban green grabbing**,' whereby developers speculate on a 'green gap' (in land valuation and prices) and "extract additional rent, surplus value, social capital and/ or prestige by locating new residential projects adjacent to new or up-and-coming green amenities" (García-Lamarca et al. 2022). Urban green grabbing can be further co-opted and expanded at a municipal, regional, and even national level as an economic and market growth strategy through the creation of a "green growth machine" that is supported by elite green branding and marketing (DuPuis and Greenberg 2019; García-Lamarca, Anguelovski, and Venner 2022).

Scholars have also investigated the directionality and contributions of greening and gentrification, considering the role of urban greening in assisting, accelerating, or directly producing gentrification. Rigolon and Collins (2023) theorize that green gentrification occurs in a cycle, where "gentrification can precede greening, gentrification can follow greening and, in some cases, **gentrification can both precede and then follow greening**." On the other hand, Quinton et al. (2023) describe a green gentrification continuum, arguing greening exists throughout all types of gentrification catalyzing processes but to varying degrees and thereby "suggesting gentrification may have a minimum 'green baseline' reflective of current widespread concerns about climate change and livability."

Consequently, as identified by "Segregating by greening: What do we mean by green gentrification?" [*Forthcoming*], the capture of urban greening into the larger global profit regime can also end up producing distinct zones of segregation by which those zones of least economic power and impact are geographically positioned in areas with the highest degree of environmental and climate risk and/or least degree of accessibility to the social, cultural, and environmental benefits of urban greening. In this process, historically marginalized groups are segregated away from greened neighborhoods, often to greyer and more-climate exposed areas. This process generates **green divides within cities** and social groups living in more privileged neighborhoods versus historically marginalized residents who continue to be pushed to more affordable areas of lesser ecological quality and climate protection (Gould and Lewis, 2016; Anguelovski and Connolly, forthcoming). In many ways, this is history repeating itself in terms of the creation of conditions that gave rise to the urban environmental justice movement.



Green resilient shoreline – East Boston, Massachusetts (Barcelona Lab for Urban Environmental Justice and Sustainability, 2021)

How do we study green gentrification?

To understand green gentrification, scholars have had to develop and utilize a variety of variables and methods which aim to study the what, where, when, why, and how related to green gentrification processes and outcomes. Studies can largely be categorized into two major methodological modalities: **spatio-temporal quantitative analyses and qualitative analyses**. In some cases, robust studies of gentrification may utilize a combination of both quantitative and qualitative analyses in order to produce a mixed-methodological approach. The figure below, reproduced from Quinton et al. (2022), demonstrates the range of data and methods deployed across these approaches to the study of green gentrification.



Figure 1. Methods used to capture the four main characteristics of green gentrification. Reproduced from Quinton et al. 2022.

Spatio-temporal quantitative analyses

Hypotheses of *when* and *where* green gentrification is occurring require spatio-temporal quantitative analytical methods to reveal demographic and socioeconomic change. These analyses mostly mobilize greening as a narrowly defined set of green spaces and can be performed at a variety of scales, however they are most commonly applied to a buffer area surrounding a greening initiative, development, or implementation (Crompton 2001; Dell'Anna, Bravi, and Bottero 2022; Hsu and Chao 2022; Triguero-Mas et al. 2022; Wu et al. 2015). Hedonic price modeling through a difference-in-difference approach is one such quantitative analysis procedure that is most commonly used to evaluate the influence of greening initiatives on surrounding home prices within an established buffer zone (Bottero et al. 2022; Caprioli, Bottero, and De Angelis 2023; Łaszkiewicz 2023; Sohn et al. 2020; Su et al. 2021). Quantitative analyses are also typically examined over a short time period comparing trends between years, commonly 5-10 years in length, following local and national data availability on urban green initiatives (and their years of creation and location) and gentrification measures (including income, race/ethnicity, education levels, and occupation, see below) (Anguelovski et al. 2022).

More recently, spatio-temporal quantitative analysis has been utilized to *predict* where gentrification processes will occur next within spatial boundaries (Anguelovski et al. 2019, 2022; Alessandro Rigolon and Németh 2020; Alessandro Rigolon, Stewart, and Gobster 2020; Shokry et al. 2021). Spatio-temporal quantitative analyses can also be operationalized to indicate other outcomes related to gentrification, yet not inherently causal, including how and when real estate development, as a primary marker of increasing land valuation and economic investment, is co-occurring (Anguelovski et al. [*Forthcoming*]). Lastly, quantitative studies have used comprehensive surveys to determine residents' perceptions of risks or existing trends of green gentrification (Antunes, March, and Connolly 2020; H. Kim, Woosnam, and Kim 2022; Oscilowicz et al. 2020).

A variety of specific indicators of demographic replacement have been utilized by researchers to parse out green gentrification processes. These indicators are largely related to race and ethnicity, such as increase of percentage of white residents (Pearsall and Eller 2020), decrease of African American residents (S. K. Kim and Wu 2022), of Hispanic residents (Schinasi et al. 2021), or residents from the Global South (Anguelovski et al. 2018; Oscilowicz et al. 2020). Other indicators used have been related to increases in housing prices (Bockarjova et al. 2020; Immergluck and Balan 2018; Rigolon and Németh 2021); and socio-economic indicators such as increases in median household income and residents with a college degree or higher (Kim and Wu 2022; Rigolon and Németh 2020).

Large-scale studies of green gentrification have developed **composite and specialized gentrification scores.** These include indicators that measure all of the above-mentioned demographic and real estate change, over diverse time periods, and at a high spatial resolution in order to produce a fuller, yet still conservative, picture of green gentrification dynamics in individual neighborhoods and across city boundaries (Anguelovski et al. 2022). In other cases, where specific trends of gentrification have been identified with greening, special indicators can also be selected to reflect these new processes/outcomes where, for example, short-term rentals and hotels are relevant to tourism as a gentrifying force (Oscilowicz et al. 2020).

In identifying spatio-temporal quantitative research methods that are still missing from existing literature, a recent systematic literature review by Quinton, Nesbitt, and Sax (2022) found that researchers have largely only looked at municipal and neighborhood dynamics and argue instead that they should consider regional, federal, or other scales beyond typical local boundaries. They also found the temporal scales of green gentrification have been limited to focusing only on 21st century processes, recommending that archival investigations should take place in order to better understand evolving processes of gentrification through time and place. Moreover, as new gentrification trends are identified, new case studies, including smaller, rural, or medium-sized cities, and novel indicators or proxies of gentrification is not occurring following greening are needed to learn from best practice, while also understanding where greening can be implemented by municipality and/or local residents most effectively (Anguelovski and Connolly 2021; Oscilowicz et al. 2023; Wilson 2018).

Qualitative analyses

To seek out *how* and *why* green gentrification is occurring and impacting residents, researchers operationalize qualitative methodologies to understand the everyday, lived experiences of displaced populations as well as the gentrification outcomes resulting from municipal greening plans. Just over half (55%) of studies investigating green gentrification took this qualitative approach by 2022 (Quinton, Nesbitt, and Sax 2022). Qualitative analyses often utilize interviews and surveys of key stakeholders involved and/or impacted by green gentrification processes including, but not limited to, long-term community residents, incoming residents, outgoing residents, real estate developers, planners, policymakers, tourists, students, etc. (Anguelovski 2016; Anguelovski and Connolly 2021; Garcia-Lamarca et al. 2021; Rigolon and Németh 2018).

Other approaches offer an array of creative methods for making the lived experience of exclusion and displacement visible. These include a critical mapping process, visualizing residential organizing work against green gentrification in support of green justice (Gentrification & Greening in Barcelona Storymaps 2022; Map of Urban Environmental Justice Struggles in Barcelona 2021). Some scholars engaged in community-driven research have focused almost entirely on the lived experiences of community members and the dissemination/amplification of community voices (Anguelovski 2016; Oscilowicz et al. 2023; Planas-Carbonell et al. 2023). Observational methodologies are also a qualitative tool that can inform whom, when, where, and how users are utilizing an observed space (Cole et al. 2021; Oscilowicz et al. 2020; Pérez-del-Pulgar et al. 2021). Finally, review of existing policy and planning documents, technical reports, or archival materials also acts as qualitative tools for investigating catalysts of green gentrification.

How does green gentrification present and manifest?

A recent multi-national study aimed to parse out the dynamics and patterns of green gentrification across three major time periods (1990-2000, 2000-2010, 2010-2016) in order to better understand existing manifestations across international contexts. Anguelovski, Connolly, et al. (2022) examined gentrification trends in 28 North American and European cities where a 'green agenda' was identifiable as a major municipal goal and found that green gentrification processes characterize citywide outcomes in 17 cities (Figure 2).



Figure 2. 17 of 28 cities studied across North America and Europe demonstrated some form of citywide green gentrification between 1990-2016. Reproduced from Anguelovski et al 2022.

Anguelovski et al. (2022) point to three distinct patterns of green gentrification: *subsidiary green gentrification* where greenspace is a relevant driver of gentrification, but is not the main factor (Detroit, Philadelphia, Washington DC); *integrated green gentrification* where greenspace is likely a driver of gentrification to a similar extent as other built environment factors (Barcelona, Boston, Denver, San Francisco, Seattle, Edinburgh); and, finally, *lead green gentrification* where greenspace is the standout driver of gentrification (Atlanta, Austin, Copenhagen, Louisville, Milwaukee, Montreal, Nantes, Vancouver). In general, this finding reflects research showing that

green gentrification is a widespread trend in Europe and especially North America that manifests at the city-wide level (and not only around specific new or redeveloped parks, for example) in a variety of urban growth and development contexts, yet it is also an uneven phenomenon. While it is not a universal phenomenon, it does make clear that certain types of interventions added between 1990 and 2020, such as high-profile parks and large greenways, nearly always spark gentrification (Gould and Lewis, 2017; Rigolon and Nemeth, 2020).

Subsidiary	Integrated	Lead	
Green Gentrification	Green Gentrification	Green Gentrification	
Detroit Philadelphia Washington D.C.	Barcelona Boston Denver Edinburgh San Francisco Seattle	Atlanta Austin Copenhagen Louisville Milwaukee Montreal Nantes	

Figure 3. Three overall types of green gentrification were identified—subsidiary, wherein greening is relevant but not a primary driver; integrated, wherein greening is roughly on par with other drivers; and lead, wherein greening is the primary driver of gentrification. Reproduced from Anguelovski et al 2022.

City-wide greening agendas

Broader processes of green gentrification can be identified within city-wide greening agendas that are adopted on the premise of improving quality of life standards through urban green space and amenities as well as adding climate change adaptation measures. Policies that address these issues are often presented within comprehensive plans, sustainability plans, and/or climate action plans (Bassett and Shandas 2010; Deetjen et al. 2018). These plans are further supported by policy standards set out by the US EPA Green Infrastructure program³ and urban green space and public health research within the US Forest Service⁴. Yet, these agendas are largely subordinate to an economic growth agenda in the sense that, in order to generate more support, they are consciously linked with increasing marketability of neighborhoods and eliciting new development, jobs, and business investments (DuPuis and Greenberg 2019; Garcia-Lamarca et al. 2021; Ortiz-Moya 2020; Viitanen and Kingston 2014). This **green growth agenda**, often touted as a 'sustainability fix' to wicked urban challenges, can initiate a race to capture the ancillary economic benefits that includes high-profile redevelopment interests as well as smaller-scale land owners, while ignoring the contribution that economic growth (and large-scale real estate developments) makes to climate change (Hickel 2021; Kallis et al. 2018).

³ <u>https://www.epa.gov/green-infrastructure</u>

⁴ <u>https://www.fs.usda.gov/research/treesearch/55820</u>



Ponce City Market along the East Atlanta Beltline – Atlanta, GA (Helen Cole and Barcelona Lab for Urban Environmental Justice and Sustainability, 2019)

High-profile redevelopment projects

Both case study investigations as well as broader, cross-national studies have illustrated that highprofile redevelopment projects, those which claim considerable news attention and are often designed or supported by global architecture and urban design brands, nearly always catalyze green gentrification (Anguelovski et al. 2022; Anguelovski and Connolly 2021). These individual sites where green gentrification processes have been well documented include the New York City High Line (Black and Richards 2020), the Atlanta Beltline (Immergluck 2022; Immergluck and Balan 2018), and the Chicago 606 Trail (Harris et al. 2020; Rigolon, Stewart, and Gobster 2020). As part of these projects and even smaller-scale ones at times, scholars have identified an **'announcement effect**' where speculative actors purchase and buy-out property for development within the localized area and perimeter of a major incoming project following public broadcast and before construction starts (Immergluck and Balan 2018).

Scale, size, type, and location of greening interventions

While scholars have almost unanimously identified high-profile redevelopment projects as major catalysts to green gentrification, small-scale parks and alternative types of green spaces have also come under critique. Initially as a framing of community resistance, the 'Just Green Enough' strategy argued that many, dispersed, small-scale neighborhood and local parks would provide the benefits of urban greening without the negative side-effects of green gentrification (Curran and

Hamilton 2012; Wolch, Byrne, and Newell 2014). Yet, these findings have been confounded by more recent studies that argue **even small-scale interventions indeed contribute to green gentrification** processes even when the size of the green space or availability of active transportation infrastructure are present (Chen et al. 2021; Rigolon and Németh 2020). In other words, despite a lack of large and high-profile new green spaces, a larger number and greater percent area of land used as a new greenspace has been found to have a strong positive impact on property values as well as gentrification processes (Connolly 2018; Du and Zhang 2020).

Exploring the gentrifying effects of differing types of green spaces, Triguero-Mas et al. (2022), found that, amongst parks, gardens, nature preserves, recreational areas, and greenways in 28 cities across North America and Europe, new parks are most strongly associated with gentrification effects, particularly for their aesthetic appeal and green branding potential (Amorim Maia et al. 2020; Anguelovski et al. 2018). In the US, the effects of parks, greenways and to some extent, community gardens are particularly prevalent (Maantay and Maroko 2009; Triguero-Mas et al. 2022). Location of new greenspace has also been investigated as scholars have demonstrated how new greenspaces in adjacent neighborhoods to recently gentrified neighborhoods as well as new green space in moderately distressed (rather than highly distressed) neighborhoods are more susceptible to gentrification processes (Heckert and Mennis 2012; Pearsall and Eller 2020; Shokry, Connolly, and Anguelovski 2020), supporting a theory of the green gentrification continuum (Quinton et al. 2023).

What do we know about displacement, exclusion, and segregation resulting from green gentrification?

Scholars have produced significant literature suggesting a variety of pathways through which green gentrification has led to displacement of residents from their neighborhoods. Throughout this literature, exclusion and segregation have also been identified co-effects, yet without direct relationship to gentrification processes. These potentially divisive aspects that can come to be attached with green climate urbanism, which push vulnerable groups into a continued position of marginality with regard for receiving the benefits and services that greening is known to provide, exemplifies the core paradox with which those seeking to green urban spaces and further an equitable climate agenda must contend. These divisions arise through primary and secondary pathways that generate direct and indirect displacement, as described in figure 4.



Figure 4. Primary pathways (solid arrows) and secondary pathways (dotted arrows) of green gentrification towards outcomes of displacement, exclusion, and segregation. Reproduced from Anguelovski, Isabelle and James JT Connolly (2023).

Direct residential displacement

Several forms of direct displacement related to green gentrification have been identified in scholarly literature. Residents can be directly displaced from their homes and their neighborhoods through processes that illegalize and/or demolish homes as a preventive or reactionary measure to disaster events (Fussell 2015). In cases of climate gentrification, greening and rewilding as tools for protection coastline ecosystems have also made illegal housing in these areas (Gould and Lewis 2021), leading to either forced or managed retreat. The US federal government now engages in buy-out programs which aim to purchase vulnerable homes in locations at risk to climate change, including but not limited to sea-level rise and flooding, which have also been investigated for mislabeling properties and forcing residents out when otherwise departure was unneeded (Siders 2019). In these buy-out programs, the criteria and processes used tend to negatively affect lower-income residents and racial minorities (Siders 2019).

Such **removal processes are part of a deeper legacy of exclusionary urban (re)development** in the US. Historically, the US Interstate system developed through the Federal Aid Highway Act of 1956 removed Black, low-income residents from their homes, later demolishing these same properties in an effort to remove 'urban blight' and site freeway infrastructure (Dimento and Ellis 2012). Transit-Oriented Development (TOD) continues to be a key driver of direct displacement when residents are removed in order to demolish homes and utilize land parcels to develop public transit infrastructure, including overland train lines and light rail stations (Jones 2023; Rayle 2015). Often, this transit-oriented development is part of a larger densification and sustainable mobility planning that is marketed under greening arguments (Cole and Immergluck 2021; L. Rice 2020). It is of note as well that direct displacement of the unhoused is also what sparked early investigations of "ecological gentrification" (Dooling 2009) and is a major factor in large scale urban greening in global south cities with informal settlements often labeled as at-risk communities (Anguelovski et al. 2019b).

Indirect residential displacement

While direct displacement removes residents from their homes through clearly-identified processes and conditions, indirect displacement produces stress and trauma for residents with three displacement outcomes: displacement from residence, from local business and economic power, and from community and place (Elliott-Cooper, Hubbard, and Lees 2020; Versey 2022). Indirect displacement from residence is largely characterized by **increases to land, property, rental value, and costs of living** within and in proximity to neighborhoods that are undergoing processes of green gentrification that reproduce the urban built fabric for the elite (Du and Zhang 2020; Immergluck and Balan 2018; S. K. Kim and Wu 2022; Maantay and Maroko 2009; Alessandro Rigolon and Németh 2020). When perceived through the 'urban green grabbing lens', indirect displacement can also be influenced by mortgage and loan schemes when homes are marketed as green, green construction, or LEED homes and developers and investors can extract symbolic rent from the newly greened value of the area (García-Lamarca et al. 2022; Knuth 2016).

Of importance here is that housing and rental costs have also been found to increase when in proximity to parks even without redevelopment or changes to said parks (Łaszkiewicz 2023). In this process, it is the mere existence of these green spaces that becomes valued by investors and buyers. This process produces new exclusionary value through the construction of green real estate projects.

Displacement of local business and community economic power

Residents can also experience indirect displacement through **loss of local businesses and subsequent harm to community economic power**, including food stores, what some have called retail, food, or commercial gentrification (Cocola-Gant 2018; Gotham 2005). Local, long-term, community-based, mom-and-pop style businesses that provide everyday services, such as grocers, local clothing retailers and tailors, and hairdressers, are most at risk of being priced out from gentrifying neighborhoods. The loss of these businesses pose deleterious impacts to demographic groups with limited mobility, whom rely on accessible and affordable services within close proximity including older persons, parents with young children, and persons with disabilities (Cocola-Gant 2018; Gotham 2005; Oscilowicz et al. 2023). Losing such businesses and services in turn reduces community economic power and solidarity, further threatening community sovereignty and resilience (Oscilowicz et al. 2023; Shaw and Hagemans 2015).

Displacement from community, place, and other socio-cultural impacts

The displacement process that is often least quantitatively measurable in scholarly literature is the indirect displacement of residents from community, place, and other associated socio-cultural impacts of (green) gentrification. However, several qualitative studies have managed to characterize this process of socio-cultural displacement by examining changes in sense of place and community.

Sense of place, community, and overall wellbeing has been described as lost or muddled as a result of some new or redeveloped green amenities that produce elite-, white-, and tourism-centered use outcomes. Marginalized residents often feel they do not belong in new and redeveloped green spaces, further impacting their sense of self and sense of identity (Anguelovski, Cole, et al. 2021; Cole et al. 2017; Jelks, Jennings, and Rigolon 2021).

Indirect displacement from park space is particularly deleterious for highly vulnerable populations such as children, children and families, and older adults who rely on green spaces as places of social interaction, social support, physical exercise, and educational opportunity (Oscilowicz et al. 2020; Pérez-del-Pulgar et al. 2021). In more extreme examples, law-enforcement or community policing of green space, motivated by efforts to conform to rules of use enforced by elite users, contributes to decreased use frequency by marginalized users, further impacting community ties, connection, and social interactions and removing opportunity to benefit from green space entirely (Cole et al. 2021). In the US, this policing and violence have been vehemently denounced by Black Lives Matter activists and environmental justice scholars as illustrating the continued violence and violations onto Black bodies in their everyday life (Pellow 2016).

Exclusion from participation in decision making in redevelopment processes

Exclusion from decision making marks another type of displacement, one where residents are removed from opportunity for discussion and participation in civic process, land use, and city planning. This exclusionary displacement process can often be as simple as city planners and policy makers not considering the practical needs of attendance of low-income, working class and other residents with intersecting vulnerabilities when town hall-style meetings, development commissions, or other opportunities for discussion are organized and advertised. Moreover, when residential displacement increases, political power and community organizing tend to evaporate, further excluding minority groups and lower-income residents from effective participation and engagement in local land development processes (Hyra 2017; Oscilowicz et al. 2023). Consequently, when residents are not invited to or part of decision making processes, community members may not buy-in to new green amenities that are introduced and developed resulting in the transformation of the amenity to a green locally unwanted land use (GreenLULU) (Anguelovski 2016; Hacker et al. 2012; Oscilowicz et al. 2023).

Exacerbating historical legacies of exclusionary practices

Exclusionary practices for civic processes and urban plans are not recent developments nor are they confined to green planning, but rather reflect historical legacies derived from colonial and racially segregated planning traditions. However, there is a particular context for the exclusionary practices relative to the issue of **unequal access to nature and healthy environments.** Whiter, higher-income groups have historically had superior access to nature and benefited more readily from earlier public and private investment in public amenities and green space, particularly when considering the large, federally funded investments into public infrastructure from the 1930s-1980s (Connolly and Anguelovski 2021; Hassen 2021; Hightower and Fraser 2020; Robertson, Parker, and Tach 2022).

These legacies have been both exacerbated as well as catalyzed by differing socio-cultural experiences of ethnic minorities when experiencing nature (Finney 2014; Stodolska and Alexandris 2004). These experiences are often characterized by psychological barriers of not feeling welcomed in predominantly-white spaces as well as fear (and experiences) of racial harassment and hate crimes in public green spaces, as has occurred in Central Park, New York City in 2022 (Finney 2014; Sreetheran and van den Bosch 2014)⁵. As a result, racialized minorities risk facing compounding environmental racisms from green gentrification (Lewartowska et al. *Forthcoming*).

Displacement to where?

While there is existing robust theoretical and some empirical literature on displacement patterns and migrations in the more generalized gentrification literature, there does not exist such rich literature for the case of green gentrification displacement. Theoretically, there is discussion on where displaced residents resulting from green gentrification go, including least valued, toxic, and peripheral spaces – mostly areas where residents can afford to live because land values and housing prices tend to be lower, and, relatedly, climate risks (and lack of climate protective infrastructure) remain higher (Anguelovski 2016; Checker 2011; Dooling 2009; Gould and Lewis 2016). One promising ongoing approach to this study includes modeling of expected population shifts when considering green climate interventions and gentrification. A pilot of this modeling completed by the author for Vancouver suggests that vulnerable populations will continue to live in the least green areas of the urban region and experience some of the more extreme climate conditions.

Why it all matters: Impacts on wellbeing and health

With multiple displacement pathways and impacts identified, we come back to why it all matters for green climate planning practice and policy: the acute impacts of green gentrification on the wellbeing and health of historically marginalized residents and their ability to sustain their lives and livelihoods in the middle of the concurring risks associated with climate change and housing

⁵ <u>https://www.cnn.com/2022/12/16/us/man-assaulted-central-park/index.html</u>

insecurity. In this context, a recent study of seven neighborhoods undergoing green gentrification in North America and Europe identifies how residents are exposed to **compounded environmental risks**, with health impacts spanning traditional (heavy pollutants, poor social conditions), transitional (decontamination, new amenities), new (gentrification, access to amenities), and emerging (displacement, climate-related risks, re-emergence of traditional exposures) exposures (Cole et al 2021). As a result of this overlap of risks (Figure 5), urban greening moves away from being part of more therapeutic landscapes for vulnerable residents to becoming disruptive green landscapes (Triguero Mas et al. 2021).



Emerging Environmental Health Exposures

Figure 5. Evolution of and compounding of environmental health exposures as neighborhoods suffering from historic environmental injustices undergo processes of urban renewal and gentrification, which, along with existing segregation, exacerbate urban health inequity. Reproduced from Cole et al. 2021.

In terms of specific health impacts, several studies have pointed to differing rates of physical activity in green space between white and non-white users with intersecting characteristics that generate vulnerabilities. This difference arises when white users use green space more often and more frequently for physical activity than racialized groups, who tend to either use these spaces less frequently or for less active recreational uses (Keith et al. 2018; Schroeder et al. 2019). In spaces where green gentrification pressures threaten historically marginalized residents, green space use by those residents has been self-reported as lower due to a weakened sense of belonging, place attachment, community building, trust, and safety in those spaces (Oscilowicz et al. 2020; Palardy, Boley, and Gaither 2018).

Changes to perceptions of safety in green spaces and amenities undergoing redevelopment are also impacted by the surrounding neighborhood changes as long-term residents are excluded from green space and/or are displaced to other greenspaces, contributing to feelings of decreased comfort and trust among minority residents when occupying white physically- and socio-culturally- dominated spaces (Kraft et al. 2021). Loss and grief experienced by removed residents exemplifies the **trauma associated with detachment from home** (Anguelovski, Cole, et al. 2021; Cole et al. 2017). Moreover, O'Neill et al. (2023) also demonstrated that without empowerment in civic and urban planning decision making, residents also experience deteriorating mental health impacts related to declining sense of community, place, and belonging.

Further, considering that green gentrification is often intertwined with other forms of gentrification, recent research has comprehensively identified the health impacts pathways experienced as a chain of community and individual traumas (Anguelovski et al. 2021; Binet et al. TBD). These pathways are described in figure 6. They include impacts from real estate speculation leading to increased housing prices; social segregation and community exclusion; and inability to access affordable healthcare.



Figure 6. Health and displacement impacts of green (and other) gentrification. Modified and reproduced from: Anguelovski et al. 2021.

From a climate justice standpoint, barriers to accessing green space and green amenities indicate that excluded and displaced residents also are **unable to access spaces of climate refuge** and the climatic resiliency services such urban greening provides. These services include, but are not limited to: urban tree canopy and shaded space to mitigate heat waves and the urban heat island effect; improved storm water management to mitigate flooding; and urban tree planting and other nature-based infrastructure solutions to prevent landslides (Culwick and Patel 2017; Hopkins et al. 2022; Shokry, Anguelovski, and Connolly 2018; Shokry, Connolly, and Anguelovski 2020; Voelkel et al. 2018). The only study to date on urban climate shelters, developed in Barcelona in a working-class neighborhood during 2022, finds that 85% of residents are unaware of the existing

network of climate shelters developed by the municipality, and 81% of them have never used a shelter to seek protection from extreme events (Amorim-Maia et al. 2023). Thus, without real and effective access to spaces providing climate change refuge, excluded and displaced residents suffer the impacts of climate change more deeply and more violently.

Greening without displacement

Given all that we know about the nexus between urban greening, gentrification, and displacement, the main goal of the next mode of practice for green climate urbanism might be simply described as "greening without displacement." As the complex relationships described in this report indicate, this is no easy task. If this is to be the goal of practice, it must address what has been a central paradox of planning within capitalist urbanization – planning that brings amenities to neighborhoods shifts market dynamics in those neighborhoods in ways that may produce perverse results. This is a question that, in some ways, extends beyond greening, but the practice of green climate urbanism can still pivot in directions that respond to this context.

How can planners integrate existing research?

Documentation and recommendations for planning practice oriented toward urban green justice have thus far occurred through three drivers of change: 1) municipal, top-down interventions (Curran and Hamilton 2012, 2017; Immergluck and Balan 2018); 2) alliances between municipality and community (Rigolon et al. 2020; Wolch, Byrne, and Newell 2014); and, 3) radical planning determined by community (Anguelovski 2014, 2015, 2016; J. J. Connolly 2021; Enelow and Hesselgrave 2015; Oscilowicz et al. 2023).

Policy implementation is a critical tool for municipalities to apply top-down interventions to mitigate or avoid the malicious effects of green gentrification. Several reports communicating and arguing for a variety of equitable pathways towards urban green justice have already been produced, including policies and tools relevant to housing equity (Chapple and Loukaitou-Sideris 2021; Rigolon and Christensen 2019) as well as green gentrification in the American context, generally prioritizing two aspects: **anti-displacement tools and inclusive greening tools** (Derickson, Klein, and Keeler 2021; Oscilowicz et al. 2022, see Figure 7 and 8). As Oscilowicz et al. (2022) posit, planning scholars have called for the development of policies and tools that follow emancipatory (Albrechts 2003), feminist (Hendler 1994), and abolitionist (Ranganathan and Bratman 2021) frameworks while also "directly confront[ing] white supremacist forms of dispossession" (Anguelovski, Brand, et al. 2021) in order to bridge between existing scholarship and implement into progressive practice.

Research has also started to show that steps in the direction of green justice should move towards di-siloed bureaucracy and move from reactive, uni-sectoral thinking toward "proactive equitable and inclusive greening in cities, while prioritizing anti-gentrification and anti-displacement practice for communities that are most socioeconomically vulnerable" (Oscilowicz et al. 2022). Such policies and tools include, but are not limited to, affordable housing measures, anti-

displacement strategies, local workforce development, and improvement of safety of and accessibility to public space. Here, scholars have based their recommendations on the demands of progressive civic movements and on the growing interest in green justice and reparative planning among urban planners themselves. The Biden administration and federal agencies have also further recognized and started to fund related projects, including through the Recovery Act⁶, the Green New Deal⁷, and recent federal environmental justice initiatives⁸.

Growing in popularity is also the development of alliances and coalitions amongst the municipality, the community, and non-profit organizations in order to de-silo and deter the planning processes that would otherwise initiate green gentrification. Such coalitions support the prescriptive practices that do not consider the direct needs of constituents. In many cases across the United States, including Los Angeles and Atlanta, non-profit park and recreation groups are leading green space and park planning in lieu of direct management from the relevant municipality. These non-profit groups, in alliance with municipalities, develop "diverse coalitions, leverage complementary strengths, coalesce with public agencies, and help generate public funds for parks" (Rigolon 2019). In other cases, as an effort to reduce patriarchal policymaking, co-design and comanagement of green space has been demonstrated to increase attachment to place as well as improve overall perceptions and use of public space by local residents (Shokry and Anguelovski 2021; Triguero-Mas, Fontán-Vela, and Dommerholt 2021).

Land-use planning has itself been adopted by communities directly, through models of selfdetermination and autonomy that prioritize anti-displacement strategies while strengthening community economic solidarity in order to produce equitable and inclusive green spaces and amenities (Anguelovski and Connolly 2021; Enelow and Hesselgrave 2015; Oscilowicz et al. 2023; Wilson 2018). Communities can embody economic and housing autonomy through implementation and development of community land trusts (CLTs) and land banks. Those tools bring greater planning power and land use decisions to civic groups and de-commodify housing while retaining affordability within a community system that still allows small, long-term financial growth for qualified home-owners (Davis 2010; Meehan 2014). Successful models include the Dudley Street Neighborhood Initiative (DSNI) in Boston, the Canyon Martín Peña in San Juan (Puerto Rico), and the Douglass Community Land Trust in Washington DC. That last CLT was purposely developed to prevent green gentrification, secure long-term affordable housing, and promote equitable development in the context of the 11th Street Bridge Street project in the historically Black neighborhood of Anacostia.

While the call has been made for research on the intersectional equity dimensions of municipal climate action across North America and Europe, only a handful of studies have offered an analytical review of the integration of equity in CAPs in select cities in the US (Angelo et al., 2022; Schrock et al., 2015; Tang et al., 2010) and Europe (Camponeschi, 2021). Notably, no study in any geographical context has yet attempted to investigate perspectives of residents and planners related to the on-the-ground realizations of CAP policies. These gaps in knowledge suggest that further research is needed into the planning and implementation of intersectional climate justice in

⁶https://oig.treasury.gov/ig_recoveryact#:~:text=The%20American%20Recovery%20and%20Reinvestment,thrive%20in%20the%2021st%20century.

⁷ <u>https://www.nytimes.com/2019/02/21/climate/green-new-deal-questions-answers.html</u>

⁸ <u>https://www.whitehouse.gov/environmentaljustice/justice40/</u>

order to understand shifting dynamics of privilege and marginalization (Fitzgerald, 2022; Sirigotis et al., 2022). Moreover, as local, state, and federal governments promise reconciliation and reparations towards Indigenous and racialized groups (Carrió & Cooper, 2022), it is imperative that CAPs account for multiple, overlapping climate vulnerabilities faced by Indigenous and racialized peoples, women, youth/children, older adults, immigrants, and other minority groups (Dooling, 2009; Pearsall, 2010). As such, there is an appetite among scholars and planners alike for a re-envisioned systems approach that shifts away from siloed government interventions and instead works across sectors to prioritize principles of restorative justice that marry climate equity with social equity.

Land use		Developer requirements/ support	Housing focused financial schemes aimed at homeowners	
Inclusionary zoning	Regulations on touristic/short- term rental apartments (e.g. AirBnB)	Obligation for developers to include affordable units in development	Property tax payment support for homeowners	Loans for home ownership for middle/ low-income residents
Up-zoning	Moratorium on new businesses, hotels, and other hospitality industry permits	Density bonuses to encourage affordable housing	Homestead tax credit/tax exemption	Development tax paid by developers towards an affordable housing trust fund
Rezoning of green space to residential space	Defence of single family homes or minimum lot size	Support for developers to develop empty lots or buildings into affordable housing	Limitations or freezes to property tax increases	Transfer tax on luxury property with funds directed towards affordable housing
Preservation Districts or Historic Districts	Community Land Trusts		Housing tax credit programmes	Tax on foreign ownership of units
Land bank			Tax on vacant housing units	
Housing focused financial schemes aimed at renters		Community focused financial schemes	Other anti-gentrification regulations/ ordinances	
Rent control		Investment incentives in specific areas Opportunity Zones, Strategic Development Zone, Special Interest Zone, Business Improvement District)	Formal recognition of the right to stay/place OR right to return	
Rent subsidies or vouchers		Regular support to housing coops and other non-profit housing organizations	Municipality or tenant opportunity to purchase act	
			Public workf	orce housing
			Equitable economic developm equitable ac	ent plans with opportunity for ccess to jobs
			Equity scoring/evaluation	n/index of urban projects

ANTI GENTRIFICATION / DISPLACEMENT POLICY RESPONSES (30)

Figure 7. Existing anti-gentrification and anti-displacement policies utilized in North America and Europe.

Reproduced from: Oscilowicz et al., 2022.

MORE GREEN AMENITIES / OPEN PUBLIC AMENITIES (20)					
Land u	Developer requirements/support				
Conservation areas to preserve green spaces	Eco-district zoning and climate change mitigation	Fee paid by developer directed to green funding			
Interim green spaces on vacant land	Rezoning of urban land to green space	Minimum amount of green space in new development projects			
Repurposing of streets of green transit areas	Opening of private green space to the public				
Measuring/mapping access to green space	Ambitious green space development plan				
Waterfront redevelopment	Green amenity planning in large-scale urban developments				
Financial schemes	Other greening regulations/ ordinances				
Specific national financial schemes to fund green infrastructure or parks	Improved maintenance and security of public space				
Green bonds	Clarification over administrative roles for green space management-security				
Regulations to support the development of urban agriculture	Improved food security or sovereignty				
New/improved urban green amenities					
Green resilient infrastructure funding in socially and environmentally vulnerable neighbourhoods					

Figure 8. Existing policies to promote more green amenities and open public amenities utilized in North America and Europe.

Reproduced from: Oscilowicz et al., 2022

How do urban planners understand green gentrification in their practice?

Given the current state of knowledge about green gentrification and its associated displacement and health impacts, it seems an opportune time to ask how the field of practice working to generate green climate urbanism might move toward a new model that internalizes this knowledge. Already, certain practitioners have taken steps in this direction.

While some literature already exists on residential real estate developers' discourse and practice in gentrifying Global North neighborhoods (Garcia-Lamarca et al. 2021), there is little published research on the perspectives and motivations of urban planners in adapting their practice to address green gentrification. However, in drawing from thus far unpublished data, we analyze existing qualitative interview data from over 100 planners in mid-sized cities across Western Europe and North America. This data collection was funded by the EU Horizon 2020 research grant *GreenLulus*. For this paper, we drew from 39 interviews with planners in the following American cities: Atlanta, Austin, Boston, Cleveland, Dallas, Philadelphia, Portland, San Francisco, Seattle, and Washington DC, and asked: 1) How do urban planners understand green gentrification in their practice; 2) What are the approaches of planners to urban greening; and, 3) What are the barriers or challenges in implementation?

In hearing from planners during interviews, there is a **general understanding and recognition that green gentrification patterns are happening and new pathways and processes for urban planning practice must be developed and implemented**. Planners have been increasingly warned by civic groups – mostly environmental justice nonprofits and community development groups – about the undesirable effects of development-led urban greening in historically underinvested communities. Generally, an equity lens is emerging as the major model for planning practice while a justice-oriented economic framework provides avenues for action. These justice visions and equity-driven missions seem to be considered through a lens that recognizes (and prioritizes for action) the spatial unequal distribution of socio-ecological vulnerability while also ensuring adequate evaluation and reporting are occurring. As a climate action planner in Boston describes,

"... the place to start is to understand where are the people who are disparaged or underserved. Where do they live? Where do they work? Where do they go get food? Where do they buy their clothes? And how are we improving our city? What does that align with where we're putting new sidewalks or improving roads or putting any stormwater infrastructure... it needs to be measured and then managed and re-evaluated on a regular basis..." (BCNUEJ Interview, 2019).

Despite widespread prioritization of climate and greening equity through the understanding that green gentrification patterns are happening, there are still unresolved issues for planners including, but not limited to: considerations of intersectional equity and the wide variety in vulnerabilities experienced by frontline communities, safeguarding greening equity interventions as benefits to community instead of a green Locally Unwanted Land Use (GreenLULU), addressing the enduring overreach of power of developers as stakeholders in land use planning, and bringing more diverse and under-represented voices to planning and decision-making processes. As a municipal planner from Cleveland shares, engagement remains what they see as a critical challenge for planners in doing justice to planning for green justice:

"I mean the greatest challenge has always been how do you engage the community so residents feel like they are part of the decision-making process and that their thoughts and their concerns are being addressed with whatever new development follows. That's always a constant challenge" (BCNUEJ Interview, 2019)."

Without more equal voices at the decision table and without a long-term, strategic planning process, a diversity of planners recognize that planning risks through urban greening and other climate adaptative measures remains an exclusionary practice that will privilege private developers (and their requests for individual licenses and permits) over the socio-ecological long-term community planning needs of a diversity of residents, especially the most vulnerable ones.

Planners also expressed the vagueness and lack of specificity in definition of green equity, inclusion, and justice as another major challenge to equitable green planning. Without a clear scope of work or defined green equity and justice goals within municipal climate action, sustainability, and/or greening plans, planners struggle to efficiently and effectively achieve successful outcomes in their practice. As a municipal planner working on the Atlanta Beltline project describes, the infancy of the field and lack of structured organization significantly limit positive action:

"I would say the biggest barrier is that [equity and inclusion are] so vague and nobody really knows what it means, or they ascribe everything to equity and inclusion and then if we're responsible for everything then it's hard to sort of make any of it happen. And then the other challenge is that it's hard to hold yourself accountable and know how to measure something when you haven't yet defined it so I would say our biggest challenge is really trying to get this organization clear about what we mean when we say equity and inclusion, how are we defining it? What results are we seeking for equity in our work? And then how will we begin to measure it over time so we know what kind of progress we're making? (BCNUEJ Interview, 2019)."

While, on one hand, most planners are operating within common agreement for the need for greening equity in light of green gentrification trends, some planners remain skeptical about the negative effects of greening or outcomes of the gentrification process. For sustainability action and neighborhood development planners, neighborhood change can be re-named or interpreted instead as neighborhood improvement. As one planner in the Eastern region of the United States explains,

"We're seeing that gentrification and displacement is a complex issue of multiple improvements in communities. So, again, I want to reinforce that greening our community does not necessarily equate to that" (BCNUEJ Interview, 2019).

In order to address challenges faced by planners, as well as suspicion of the current framing of green gentrification in planning research and literature, new pathways and processes for urban planning practice must be developed and implemented.

Despite these challenges and barriers, many green equity planners have found **success in deep engagement** which includes opening frequent, adequate, and accessible space for intersectional, inclusive conversation and listening. As a climate action planner from Seattle illuminates,

"So over the past 10 years there's been a dramatic restructuring of how we do community engagement from thinking about inclusivity about how many languages you publish information in to thinking about inclusivity as a total restructuring and leading with conversations in communities of color and low income communities and paying for, to do it in ways that's comfortable for those communities not one, not by a bigger tent but by many small tents and figuring out how to have many multiple conversations. So that piece of it has been actually not part of this but a big change in the way we do work" (BCNUEJ Interview, 2019).

The same Seattle planner also describes the success found in compounding the benefits of economic development work. Here they describe the aims to produce nuanced cobenefits that can limit top-down, prescriptive planning and instead abide by community desire in green planning and design:

> "What I learned is how we can have very overt racial equity outcomes and use those across all of the projects that we work on to try to shift and align those pieces to different outcomes. So that means if we're looking at building a sidewalk, how does that sidewalk create opportunity for wealth creation in the community? How does that sidewalk reflect [the community]? How do we choose which sidewalks to build based on the community's priorities for where they want to go? Same with lighting and public safety improvements, etc. It's a big change in that previously we would say lights are good and that lights should follow, get people to transit, to schools or whatever and we might be right about that but chances are we'll be pretty wrong in a community of color because we'd be bringing our biases to it. So this has been a real opportunity for us to dig deeply into a change that we've been doing in terms of understanding priorities, into really putting that into the practice in a way that's deeper than has ever been done before" (BCNUEJ Interview, 2019).

Recommendations for all global policy-makers, planners, and community activists



Consider historic and political contexts of a municipality is a critical first step in order to best understand the needs of socially vulnerable residents and how best to address them through equitable housing and green (re)development practices.



Implement participatory planning practices and community engagement in the (re)development of all green spaces and green amenities is paramount to all processes of placemaking and city planning.



Encourage housing stability, critical for economic, physical, and mental wellbeing, through density bonuses, inclusionary zoning, or other developer focused-policies aiming to ensure affordable housing provision. All such policies should be coupled with policies to prevent tenant displacement, such as rent control, subsidies and use of land banks.



Ensure equal access to green space first through mapping and benchmarking, followed by implementation of policies that mandate a minimum area of green space per resident in order to achieve positive mental and physical health outcomes.



Improve maintenance and security of public space and the transformation of vacant lots into spaces that address the needs of communities can especially benefit children, families, and women.



Develop policies and regulations that fund and provide green space for urban gardens to provide food security and spaces for socialization, while also addressing their possible gentrifying effects on nearby neighborhoods.



Enhance climate change mitigation and adaptation through environmental development tools such as the designation of Eco-District zoning, employment of green bonds, or conservation areas to preserve green spaces, while also considering the social impacts of such measures.

Figure 9. Suggested guiding principles for urban planners across global cities for the realization of the just, green city.

Reproduced from: Oscilowicz et al., 2022.

Toward a new mode of practice in green climate urbanism

A great deal has been accomplished by the field of professionals and volunteers working to leverage the opportunities that cities present for creating a more climate just world. Yet, given all that we know about the emerging links between urban greening and social equity in cities, a new mode of practice is needed for the next phase of green climate urbanism. This new mode, most urgently, internalizes the potential for green gentrification to serve as an engine for displacement, which in turn compromises the efficacy of efforts to reduce climate risk among vulnerable populations. It accepts, for example, that green climate actions and housing dynamics are inseparable dimensions of the same challenge. This shift toward an even more systemic approach, which must be acknowledged, makes doing things more difficult. But perhaps that is the heart of the matter – no matter how you look at it, the next mode of green climate urbanism is more difficult.

Addressing the difficult issues raised by the emerging link between green climate urbanism and social equity is an urgent matter. If these issues are not handled now, then rather than reducing climate risk for all, green climate urbanism may instead shift risk around so that the most vulnerable continue to be so over time. This would lead in exactly the wrong direction from the view of those who are shifted and experience continued negative impacts from climate change. It would, in turn, weaken support among groups concerned with social equity, affordable housing, and community development in cities – these groups should be natural allies for climate action. Thus, as hard as it is to move toward a mode of practice that is always reflecting on the multi-dimensional impacts of climate action, it will be harder to continue with green climate urbanism if there is a continued perverse outcome of energizing coalitions organized against it. Again, no matter how you look at it, the next mode of green climate urbanism is more difficult.

Based on the findings reported here, this new mode of practice would do at least three things differently in the future:

(1) Avoid opportunistic implementation of green climate interventions based on onedimensional goals through transversal governance that bridges diverse agencies and community voices. This transversal mode of action would move toward interventions placed due to conscious and ongoing intervention in regional social-ecological dynamics.

- **Prioritize** greening implementation according to ecological and social health/wellbeing benefits. With increasing calls to build healthy and green cities for all by international organizations and networks such as UNHabitat, WHO, C40, or the Covenant of Mayors for Climate and Energy, it is this union of greening and health that can be the primary driver of a shift toward a mode of practice more rooted in climate justice. As is already the practice in some areas, place the desired health outcomes as the primary metric for deciding climate actions. Not only will this approach allow for equity to be at the center of planning, but it also avoids contributing to new climate impacts through a shallow, glossy, aesthetics-focused urban green branding approach to planning practice that actually prioritizes economic growth rather than social or ecological wellbeing.
- Take a transversal approach to urban climate governance, so that siloed groups within bureaucracies do not serve as the final arbiter of where and when interventions happen. That is, climate action is not solely a decision for a parks, health, development, or water

management agency. Rather, it aligns with the crosscutting goals of green climate urbanism that accounts for social equity and ecological integrity. The reason for a transversal approach is not just an abstract goal – it hinders the capacity of the climate agenda to be "captured" by particular interests. As well, this transversal approach needs to be continually animated by ongoing bridges with external community voices from a variety of perspectives. Improved practices for ensuring these links can include, but are not limited to, organizing meetings during a feasible time for the local population, providing childcare services during the meeting, providing meals and refreshments to community members, offering translating services, or providing compensation for missing work or domestic work activities (Evans-Cowley and Hollander 2010; Sandfort 2017).

• Place real estate development at the service of human and ecological health and wellbeing, rather than making it the driver of planning and policy decisions. Real estate development obviously remains a central actor of land use planning and economic development, but planning and planners should dare to be vocal and political, framing progressive and equity-centered visions for the future green city and determining which types of land uses, zoning, incentives, and regulations can ensure that private development serves socio-ecological wellbeing and climate needs together. Planners should never push aside questions of people's right to live in the city – housing is part of green climate urbanism. Many of the green gentrification outcomes found in research would certainly be much more limited would the US have preserved and developed public housing to a similar extent that places like Austria, Denmark, or the Netherlands have historically done. There is room in the next mode of practice to push toward greater residential security for people.

(2) Incorporate a wide view of benefits and disbenefits of green climate interventions that accounts for social equity implications.

- Identify the diversity of positive and negative impacts on urban greening both in the short- and mid-term. The widely used ecosystem services framework, which has been popularized and enriched since the Millennium Ecosystem Assessment (2003) takes us a long way toward understanding benefits and disbenefits of green climate interventions, but scholarly work in this area is only beginning to wrestle with the full social justice implications. The practice of green climate urbanism should take this process further by leveraging transversal governance as a means for developing continual feedback on the interaction effects that arise. That is, benefits and disbenefits cannot be assessed in a static fashion, but rather must be feeding a process of continual alteration. When interventions generate impacts like green gentrification, this should be known and a response should be formulated.
- **Continuously assess and evaluate interactions.** Beyond the greening and equity connections, green climate urbanism responds to a dynamic set of conditions derived from climate change. Thus, it is not a matter of generating interventions and walking away, but rather an ongoing process of management and evaluation of positive and negative socio-ecological impacts as well as recalibration of interventions both in the ecological and social domains.

(3) Serve as a lever for change from the status quo in areas receiving green climate interventions.

• **Put green climate urbanism at the service of social and ecological change**. While it might be the case that many originators of green climate urbanism see interventions as reflective of incremental alterations from the historical norm, and rightly so, there is a deeper level of interaction with processes of social transformation that can be incorporated. This deeper level is where a more lasting effect comes from. Put simply, this is a matter of allowing green climate urbanism to be a portal for alterations to the status quo, even if there is a political price to be paid. Most importantly, this means that elected officials have a key role to play in the next mode of practice.

In all, this new mode of practice means that green climate urbanism would lean more toward climate justice frameworks than toward green growth frameworks. While this may seem an easy thing to say, it is, in practice, quite challenging to realize. Indeed, the next mode of practice that accounts for greening induced displacement is harder than what came before it.

References

Agyeman, Julian. 2008. "Toward a 'Just' Sustainability?" Continuum 22(6): 751-56.

- Agyeman, Julian, David Schlosberg, Luke Craven, and Caitlin Matthews. 2016. "Trends and Directions in Environmental Justice: From Inequity to Everyday Life, Community, and Just Sustainabilities." *Annual Review of Environment and Resources* 41(1): 321–40.
- Albrechts, Louis. 2003. "Planning and Power: Towards an Emancipatory Planning Approach." Environment and Planning C: Government and Policy 21(6): 905–24.
- Ali, E. et al. 2022. "Climate Change 2022: Impacts, Adaptation and Vulnerability." *IPCC Sixth Assessment Report.*
- Alkon, Alison, and Julian Agyeman. 2011. *Cultivating Food Justice: Race, Class, and Sustainability*. The MIT Press. https://direct.mit.edu/books/edited-volume/4423/Cultivating-Food-JusticeRace-Class-and (September 5, 2023).
- Angelo, Hillary. 2019. "Added Value? Denaturalizing the 'Good' of Urban Greening." *Geography Compass* 13(8): e12459.
- Anguelovski, Isabelle. 2014. Neighborhood as Refuge: Community Reconstruction, Place Remaking, and Environmental Justice in the City. MIT press.

 - ——. 2016. "From Toxic Sites to Parks as (Green) LULUs? New Challenges of Inequity, Privilege, Gentrification, and Exclusion for Urban Environmental Justice." *Journal of Planning Literature* 31(1): 23–36.

——. 2019. "New Scholarly Pathways on Green Gentrification: What Does the Urban 'Green Turn'Mean and Where Is It Going?" *Progress in human geography* 43(6): 1064–86.

- Anguelovski, Isabelle, Helen VS Cole, et al. 2021. "Gentrification Pathways and Their Health Impacts on Historically Marginalized Residents in Europe and North America: Global Qualitative Evidence from 14 Cities." *Health & Place* 72: 102698.
- Anguelovski, Isabelle et al. 2022. "Green Gentrification in European and North American Cities." *Nature Communications* 13(1): 3816.
- Anguelovski, Isabelle, Anna Livia Brand, Malini Ranganathan, and Derek Hyra. 2021. "Decolonizing the Green City: From Environmental Privilege to Emancipatory Green Justice." *Environmental Justice*.

- Anguelovski, Isabelle, and James J. T. Connolly. 2021. *The Green City and Social Injustice: 21 Tales from North America and Europe*. Routledge.
- Anguelovski, Isabelle, James J. T. Connolly, Laia Masip, and Hamil Pearsall. 2018. "Assessing Green Gentrification in Historically Disenfranchised Neighborhoods: A Longitudinal and Spatial Analysis of Barcelona." *Urban Geography* 39(3): 458–91.
- Anguelovski, Isabelle, Malini Ranganathan, and Derek Hyra. 2021. "The Racial Inequities of Green Gentrification in Washington, DC." In *The Green City and Social Injustice*, Routledge, 160–70.
- Antunes, Bianca, Hug March, and James J. T. Connolly. 2020. "Spatializing Gentrification in Situ: A Critical Cartography of Resident Perceptions of Neighbourhood Change in Vallcarca, Barcelona." *Cities* 97: 102521.
- Banzhaf, Spencer. 2012. *The Political Economy of Environmental Justice*. Stanford University Press.
- Bellezoni, Rodrigo A., Fanxin Meng, Pan He, and Karen C. Seto. 2021. "Understanding and Conceptualizing How Urban Green and Blue Infrastructure Affects the Food, Water, and Energy Nexus: A Synthesis of the Literature." *Journal of Cleaner Production* 289: 125825.
- Bockarjova, M., W. J. W. Botzen, M. H. van Schie, and M. J. Koetse. 2020. "Property Price Effects of Green Interventions in Cities: A Meta-Analysis and Implications for Gentrification." *Environmental Science & Policy* 112: 293–304.
- Bottero, Marta et al. 2022. "Urban Parks, Value Uplift and Green Gentrification: An Application of the Spatial Hedonic Model in the City of Brisbane." *Urban Forestry & Urban Greening* 74: 127618.
- Breuste, Jürgen, Johanna Schnellinger, Salman Qureshi, and Anna Faggi. 2013. "Urban Ecosystem Services on the Local Level: Urban Green Spaces as Providers." *Ekológia* (*Bratislava*) 32(3): 290–304.
- Bullard, Robert D. 1994. "Overcoming Racism in Environmental Decisionmaking." *Environment: Science and policy for sustainable development* 36(4): 10–44.
- Campello Torres, Pedro Henrique, and Pedro Roberto Jacobi, eds. 2021. *Towards a Just Climate Change Resilience: Developing Resilient, Anticipatory and Inclusive Community Response*. Cham: Springer International Publishing. https://link.springer.com/10.1007/978-3-030-81622-3 (August 23, 2023).
- Caprioli, Caterina, Marta Bottero, and Elena De Angelis. 2023. "Combining an Agent-Based Model, Hedonic Pricing and Multicriteria Analysis to Model Green Gentrification Dynamics." *Computers, Environment and Urban Systems* 102: 101955.

- Chapple, Karen, and Anastasia Loukaitou-Sideris. 2021. "White Paper on Anti-Displacement Strategy Effectiveness."
- Chavis, Benjamin F., and Charles Lee. 1987. "Toxic Wastes and Race in the United States: A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites." *Commission for Racial Justice, United Church of Christ.*
- Checker, Melissa. 2011. "Wiped Out by the 'Greenwave': Environmental Gentrification and the Paradoxical Politics of Urban Sustainability." *City & Society* 23(2): 210–29.
- Chu, Eric K, and Clare EB Cannon. 2021. "Equity, Inclusion, and Justice as Criteria for Decision-Making on Climate Adaptation in Cities." *Current Opinion in Environmental Sustainability* 51: 85–94.
- Cocola-Gant, Agustín. 2018. "Tourism Gentrification." In *Handbook of Gentrification Studies*, Edward Elgar Publishing, 281–93.
- Cohen-Cline, Hannah, Eric Turkheimer, and Glen E. Duncan. 2015. "Access to Green Space, Physical Activity and Mental Health: A Twin Study." *J Epidemiol Community Health* 69(6): 523–29.
- Cole, Helen V.S. et al. 2021. "Adapting the Environmental Risk Transition Theory for Urban Health Inequities: An Observational Study Examining Complex Environmental Riskscapes in Seven Neighborhoods in Global North Cities." Social Science & Medicine 277: 113907.
- Cole, Helen V.S., and Daniel Immergluck. 2021. "Reshaping Legacies of Green and Transit Justice through the Atlanta Beltline." In *The Green City and Social Injustice*, Routledge, 137–47.
- Cole, Helen V.S., Melisa Garcia Lamarca, James JT Connolly, and Isabelle Anguelovski. 2017. "Are Green Cities Healthy and Equitable? Unpacking the Relationship between Health, Green Space and Gentrification." *J Epidemiol Community Health* 71(11): 1118–21.
- Collier, Marcus et al. 2023. "An Integrated Process for Planning, Delivery, and Stewardship of Urban Nature-Based Solutions: The Connecting Nature Framework." *Nature-Based Solutions*: 100060.
- Connolly, James J. T. 2019. "From Jacobs to the Just City: A Foundation for Challenging the Green Planning Orthodoxy." *Cities* 91: 64–70.
- Connolly, James J. T., and Isabelle Anguelovski. 2021. "Three Histories of Greening and Whiteness in American Cities." *Frontiers in Ecology and Evolution* 9.
- Connolly, James JT. 2021. "A Community Fights for Its Health While Battling Impending Gentrification: Bayview-Hunters Point, San Francisco." In *The Green City and Social Injustice*, Routledge, 111–22.

- Coventry, PA et al. 2019. "The Mental Health Benefits of Purposeful Activities in Public Green Spaces in Urban and Semi-Urban Neighbourhoods: A Mixed-Methods Pilot and Proof of Concept Study." *International Journal Of Environmental Research And Public Health* 16(15).
- Crompton, John L. 2001. "The Impact of Parks on Property Values: A Review of the Empirical Evidence." *Journal of Leisure Research* 33(1): 1–31.
- Culwick, Christina, and Zarina Patel. 2017. "United and Divided Responses to Complex Urban Issues: Insights on the Value of a Transdisciplinary Approach to Flooding Risk." *AREA* 49(1): 43–51.
- Curran, Winifred, and Trina Hamilton. 2012. "Just Green Enough: Contesting Environmental Gentrification in Greenpoint, Brooklyn." *Local Environment* 17(9): 1027–42.
 - ———. 2017. Just Green Enough: Urban Development and Environmental Gentrification. Routledge.
- Dadvand, Payam et al. 2018. "The Association between Lifelong Greenspace Exposure and 3-Dimensional Brain Magnetic Resonance Imaging in Barcelona Schoolchildren." *Environmental health perspectives* 126(2): 027012.
- Data-Driven Effort to Advance Park Equity Expands. 2022. National Recreational and Park Association. https://www.nrpa.org/blog/data-driven-effort-to-advance-park-equity-expands/ (September 5, 2023).
- Davis, John Emmeus. 2010. "Origins and Evolution of the Community Land Trust in the United States." *The community land trust reader* 1(4): 3–47.
- De Sousa, Christopher. 2014. "The Greening of Urban Post-Industrial Landscapes: Past Practices and Emerging Trends." *Local Environment* 19(10): 1049–67.
- Dell'Anna, Federico, Marina Bravi, and Marta Bottero. 2022. "Urban Green Infrastructures: How Much Did They Affect Property Prices in Singapore?" *Urban Forestry & Urban Greening* 68: 127475.
- Derickson, Kate, Mira Klein, and Bonnie L. Keeler. 2021. "Reflections on Crafting a Policy Toolkit for Equitable Green Infrastructure." *npj Urban Sustainability* 1(1): 1–4.
- Dimento, Joseph F. C., and Cliff Ellis. 2012. *Changing Lanes: Visions and Histories of Urban Freeways.* MIT Press.
- Dooling, Sarah. 2009. "Ecological Gentrification: A Research Agenda Exploring Justice in the City." *International Journal of Urban and Regional Research* 33(3): 621–39.
- Du, Mengbing, and Xiaoling Zhang. 2020. "Urban Greening: A New Paradox of Economic or Social Sustainability?" *Land Use Policy* 92: 104487.

- DuPuis, E. Melanie, and Miriam Greenberg. 2019. "The Right to the Resilient City: Progressive Politics and the Green Growth Machine in New York City." *Journal of Environmental Studies and Sciences* 9(3): 352–63.
- Elliott-Cooper, Adam, Phil Hubbard, and Loretta Lees. 2020. "Moving beyond Marcuse: Gentrification, Displacement and the Violence of Un-Homing." *Progress in Human Geography* 44(3): 492–509.
- Enelow, Noah, and Taylor Hesselgrave. 2015. Verde and Living Cully: A Venture in *Placemaking*. Ecotrust.
- Escobedo, Francisco J. et al. 2019. "Urban Forests, Ecosystem Services, Green Infrastructure and Nature-Based Solutions: Nexus or Evolving Metaphors?" *Urban Forestry & Urban Greening* 37: 3–12.
- Evans-Cowley, Jennifer, and Justin Hollander. 2010. "The New Generation of Public Participation: Internet-Based Participation Tools." *Planning Practice & Research* 25(3): 397–408.
- Finney, Carolyn. 2014. Black Faces, White Spaces: Reimagining the Relationship of African Americans to the Great Outdoors. UNC Press Books.
- Fisher, Dana, Erika Svendsen, and James Connolly. 2015. Urban Environmental Stewardship and Civic Engagement: How Planting Trees Strengthens the Roots of Democracy. London: Routledge.
- Fullilove, Mindy Thompson. 1996. "Psychiatric Implications of Displacement: Contributions from the Psychology of Place." *American Journal of Psychiatry* 153: 12.
- Fussell, Elizabeth. 2015. "The Long-Term Recovery of New Orleans' Population After Hurricane Katrina." *American Behavioral Scientist* 59(10): 1231–45.
- Garcia-Lamarca, Melissa et al. 2021. "Urban Green Boosterism and City Affordability: For Whom Is the 'Branded' Green City?" *Urban Studies* 58(1): 90–112.
- García-Lamarca, Melissa et al. 2022. "Urban Green Grabbing: Residential Real Estate Developers Discourse and Practice in Gentrifying Global North Neighborhoods." *Geoforum* 128: 1–10.
- García-Lamarca, Melissa, Isabelle Anguelovski, and Kayin Venner. 2022. "Challenging the Financial Capture of Urban Greening." *Nature Communications* 13(1): 7132.
- Gascon, Mireia et al. 2015. "Mental Health Benefits of Long-Term Exposure to Residential Green and Blue Spaces: A Systematic Review." *International Journal of Environmental Research and Public Health* 12(4): 4354–79.

- "Gentrification & Greening in Barcelona." 2022. *ArcGIS StoryMaps*. https://storymaps.arcgis.com/collections/53df8639c6d74c6c87fcee10dd35960d (September 5, 2023).
- Glass, Ruth. 1964. "Introduction: Aspects of Change, Bo: London: Aspects of Change." *Center* for Urban Studies, London: MacKibbon and Kee, xiii–xlii.
- Gotham, Kevin Fox. 2005. "Tourism Gentrification: The Case of New Orleans' Vieux Carre (French Quarter)." Urban Studies 42(7): 1099–1121.
- Gould, Kenneth A., and Tammy L. Lewis. 2016. *Green Gentrification: Urban Sustainability and the Struggle for Environmental Justice*. Routledge.
- . 2021. "Resilience Gentrification: Environmental Privilege in an Age of Coastal Climate Disasters." *Frontiers in Sustainable Cities* 3. https://www.frontiersin.org/articles/10.3389/frsc.2021.687670 (May 27, 2023).
- Hacker, Karen et al. 2012. "Community Capacity Building and Sustainability: Outcomes of Community-Based Participatory Research." *Progress in community health partnerships : research, education, and action* 6(3): 349–60.
- Hassen, Yasmine. 2021. "The Attempted Lynching of Black Geographies: A Black Feminist Retheorization of Gentrification as a Tool of Neoliberal Plantation Logics." University of Toronto (Canada).
- Heckert, Megan, and Jeremy Mennis. 2012. "The Economic Impact of Greening Urban Vacant Land: A Spatial Difference-In-Differences Analysis." *Environment and Planning A: Economy and Space* 44(12): 3010–27.
- Hendler, Sue. 1994. "Feminist Planning Ethics." Journal of Planning Literature 9(2): 115-27.
- Hickel, Jason. 2021. "What Does Degrowth Mean? A Few Points of Clarification." *Globalizations* 18(7): 1105–11.
- Hightower, Cameron, and James C. Fraser. 2020. "The Raced–Space of Gentrification: 'Reverse Blockbusting,' Home Selling, and Neighborhood Remake in North Nashville." *City & Community* 19(1): 223–44.
- Hopkins, Loren P., Deborah J. January-Bevers, Erin K. Caton, and Laura A. Campos. 2022. "A Simple Tree Planting Framework to Improve Climate, Air Pollution, Health, and Urban Heat in Vulnerable Locations Using Non-Traditional Partners." *Plants People Planet* 4(3): 243–57.
- Hosseini, Fatemeh, Hassan Sajadzadeh, Farshid Aram, and Amir Mosavi. 2021. "The Impact of Local Green Spaces of Historically and Culturally Valuable Residential Areas on Place Attachment." *Land* 10(4): 351.

- Hsu, Kuo-Wei, and Jen-Chih Chao. 2022. "The Impact of Urban Green-Infrastructure Development on the Price of Surrounding Real Estate: A Case Study of Taichung City's Central District." *IOP Conference Series: Earth and Environmental Science* 1006(1): 012012.
- Hyra, Derek S. 2017. *Race, Class, and Politics in the Cappuccino City*. Chicago, IL: University of Chicago Press.
- Immergluck, Dan, and Tharunya Balan. 2018. "Sustainable for Whom? Green Urban Development, Environmental Gentrification, and the Atlanta Beltline." *Urban Geography* 39(4): 546–62.
- Jayasooriya, V. M., A. W. M Ng, S. Muthukumaran, and B. J. C. Perera. 2017. "Green Infrastructure Practices for Improvement of Urban Air Quality." *Urban Forestry & Urban Greening* 21: 34–47.
- Jelks, Na'Taki Osborne, Viniece Jennings, and Alessandro Rigolon. 2021. "Green Gentrification and Health: A Scoping Review." *International Journal Of Environmental Research And Public Health* 18(3): 907.
- Jones, Craig E. 2023. "Transit-Oriented Development and Suburban Gentrification: A 'Natural Reality' of Refugee Displacement in Metro Vancouver." *Housing Policy Debate* 33(3): 533–52.
- Kallis, Giorgos et al. 2018. "Research On Degrowth." *Annual Review of Environment and Resources* 43(1): 291–316.
- Keith, Samuel J. et al. 2018. "Greenway Use and Preferences in Diverse Urban Communities: Implications for Trail Design and Management." *Landscape and Urban Planning* 172: 47–59.
- Kim, Donghyun, and Seul-Ki Song. 2019. "The Multifunctional Benefits of Green Infrastructure in Community Development: An Analytical Review Based on 447 Cases." Sustainability 11(14): 3917.
- Kim, Hyun, Kyle Maurice Woosnam, and Hyewon Kim. 2022. "Urban Gentrification, Social Vulnerability, and Environmental (in) Justice: Perspectives from Gentrifying Metropolitan Cities in Korea." *Cities* 122: 103514.
- Kim, Seung Kyum, and Soonae Park. 2023. "How Does Exposure to Climate Risk Contribute to Gentrification?" *Cities* 137: 104321.
- Kim, Seung Kyum, and Longfeng Wu. 2022. "Do the Characteristics of New Green Space Contribute to Gentrification?" *Urban Studies* 59(2): 360–80.
- Klompmaker, Jochem O. et al. 2023. "Racial, Ethnic, and Socioeconomic Disparities in Multiple Measures of Blue and Green Spaces in the United States." *Environmental Health Perspectives* 131(1): 017007.

- Knuth, Sarah. 2016. "Seeing Green in San Francisco: City as Resource Frontier." *Antipode* 48(3): 626–44.
- Kosanic, Aleksandra, and Jan Petzold. 2020. "A Systematic Review of Cultural Ecosystem Services and Human Wellbeing." *Ecosystem Services* 45: 101168.
- Kotsila, Panagiota et al. 2020. "Nature-Based Solutions as Discursive Tools and Contested Practices in Urban Nature's Neoliberalisation Processes." 4(2): 252–74.
- Kraft, Amber N. et al. 2021. "Racial/Ethnic and Educational Differences in Perceptions and Use of a New Urban Trail." *Ethnicity & Health* 26(4): 614–29.
- Laszkiewicz, Edyta. 2023. "Towards Green Gentrification? The Interplay between Residential Change, the Housing Market, and Park Proximity." *Housing Studies* 0(0): 1–20.
- Lazaro, Lira Luz Benites et al. 2022. "Ten Years of Research on the Water-Energy-Food Nexus: An Analysis of Topics Evolution." *Frontiers In Water* 4.
- Lee, A.C.K., and R. Maheswaran. 2011. "The Health Benefits of Urban Green Spaces: A Review of the Evidence." *Journal of Public Health* 33(2): 212–22.
- Lees, Loretta, Hyun Bang Shin, and Ernesto López-Morales. 2016. *Planetary Gentrification*. John Wiley & Sons.
- Loder, Angela. 2020. Small-Scale Urban Greening: Creating Places of Health, Creativity, and Ecological Sustainability. Routledge.
- Maantay, Juliana, and Andrew Maroko. 2009. "Mapping Urban Risk: Flood Hazards, Race, & Environmental Justice in New York." *Applied geography* 29(1): 111–24.
- "Map of Urban Environmental Justice Struggles in Barcelona." 2021. *ArcGIS StoryMaps*. https://storymaps.arcgis.com/stories/cda97c15ece54986b974cfbf988609c0 (September 5, 2023).
- Meehan, James. 2014. "Reinventing Real Estate: The Community Land Trust as a Social Invention in Affordable Housing." *Journal of Applied Social Science* 8(2): 113–33.
- Nesbitt, Lorien et al. 2017. "The Social and Economic Value of Cultural Ecosystem Services Provided by Urban Forests in North America: A Review and Suggestions for Future Research." *Urban Forestry & Urban Greening* 25: 103–11.
- O'Neill, Ella et al. 2023. "The Right to the Unhealthy Deprived City: An Exploration into the Impacts of State-Led Redevelopment Projects on the Determinants of Mental Health." *Social Science & Medicine* 318: 115634.
- Oscilowicz, Emilia et al. 2020. "Young Families and Children in Gentrifying Neighbourhoods: How Gentrification Reshapes Use and Perception of Green Play Spaces." *Local Environment* 25: 765–86.

-. 2022. "Green Justice through Policy and Practice: A Call for Further Research into Tools That Foster Healthy Green Cities for All." *Cities & Health*. https://www.tandfonline.com/doi/abs/10.1080/23748834.2022.2072057 (May 30, 2022).

- ------. 2023. "Grassroots Mobilization for a Just, Green Urban Future: Building Community Infrastructure against Green Gentrification and Displacement." *Journal of Urban Affairs*: 1–34.
- Palardy, Nathan P., B. Bynum Boley, and Cassandra Johnson Gaither. 2018. "Resident Support for Urban Greenways across Diverse Neighborhoods: Comparing Two Atlanta BeltLine Segments." *Landscape and Urban Planning* 180: 223–33.
- "ParkScore® Scoring Metrics." 2022. *Trust for Public Land*. https://www.tpl.org/parkscore/rankings (May 11, 2023).
- Pearsall, Hamil, and Jillian K. Eller. 2020. "Locating the Green Space Paradox: A Study of Gentrification and Public Green Space Accessibility in Philadelphia, Pennsylvania." Landscape and Urban Planning 195: 103708.
- Pellow, David N. 2016. "Toward a Critical Environmental Justice Studies: Black Lives Matter as an Environmental Justice Challenge." *Du Bois Review: Social Science Research on Race* 13(2): 221–36.
- Pérez-del-Pulgar, Carmen et al. 2021. "The Relationship between Residential Proximity to Outdoor Play Spaces and Children's Mental and Behavioral Health: The Importance of Neighborhood Socio-Economic Characteristics." *Environmental Research* 200: 111326.
- Planas-Carbonell, Aina et al. 2023. "From Greening the Climate-Adaptive City to Green Climate Gentrification? Civic Perceptions of Short-Lived Benefits and Exclusionary Protection in Boston, Philadelphia, Amsterdam and Barcelona." *Urban Climate* 48: 101295.
- Quinton, Jessica, Lorien Nesbitt, and Daniel Sax. 2022. "How Well Do We Know Green Gentrification? A Systematic Review of the Methods." *Progress in Human Geography*: 03091325221104478.

Quinton, Jessica, Lorien Nesbitt, James Connolly, Elvin Wyly. 2023. "How Common is Urban Greening in Gentrifying Areas?" *Urban Geography. https://doi.org/10.1080/02723638.2023.2258687*

- Ranganathan, Malini, and Eve Bratman. 2021. "From Urban Resilience to Abolitionist Climate Justice in Washington, DC." *Antipode* 53(1): 115–37.
- Rayle, Lisa. 2015. "Investigating the Connection Between Transit-Oriented Development and Displacement: Four Hypotheses." *Housing Policy Debate* 25(3): 531–48.
- Raymond, Christopher M., Richard Stedman, and Niki Frantzeskaki. 2023. "The Role of Nature-Based Solutions and Senses of Place in Enabling Just City Transitions." *Environmental Science & Policy* 144: 10–19.

- Rice, Jennifer L., Daniel Aldana Cohen, Joshua Long, and Jason R. Jurjevich. 2020.
 "Contradictions of the Climate-Friendly City: New Perspectives on Eco-Gentrification and Housing Justice." *International Journal of Urban and Regional Research* 44(1): 145–65.
- Rice, Louis. 2020. "Nature-Based Solutions for Urban Development and Tourism." *International Journal Of Tourism Cities* 6(2): 431–48.
- Riechers, Maraja, Jan Barkmann, and Teja Tscharntke. 2018. "Diverging Perceptions by Social Groups on Cultural Ecosystem Services Provided by Urban Green." *Landscape and Urban Planning* 175: 161–68.
- Rigolon, A., and J. Christensen. 2019. *Greening without Gentrification: Learning from Parks-Related Anti-Displacement Strategies Nationwide*. University of Utah & UCLA's Institute of the Environment and Sustainability
- Rigolon, Alessandro. 2019. "Nonprofits and Park Equity in Los Angeles: A Promising Way Forward for Environmental Justice." *Urban Geography* 40(7): 984–1009.
- Rigolon, Alessandro, and Timothy Collins. 2023. "The Green Gentrification Cycle." *Urban Studies* 60(4): 770–85.
- Rigolon, Alessandro, and Jeremy Németh. 2018. "'We're Not in the Business of Housing:' Environmental Gentrification and the Nonprofitization of Green Infrastructure Projects." *Cities* 81: 71–80.
- ------. 2020. "Green Gentrification or 'Just Green Enough': Do Park Location, Size and Function Affect Whether a Place Gentrifies or Not?" *Urban Studies* 57(2): 402–20.
- ———. 2021. "What Shapes Uneven Access to Urban Amenities? Thick Injustice and the Legacy of Racial Discrimination in Denver's Parks." *Journal of Planning Education and Research* 41(3): 312–25.
- Rigolon, Alessandro, William P. Stewart, and Paul H. Gobster. 2020. "What Predicts the Demand and Sale of Vacant Public Properties? Urban Greening and Gentrification in Chicago." *Cities* 107: 102948.
- Robertson, Cassandra, Emily Parker, and Laura Tach. 2022. "Historical Redlining and Contemporary Federal Place-Based Policy: A Case of Compensatory or Compounding Neighborhood Inequality?" *Housing Policy Debate* 0(0): 1–24.
- Sandfort, Kathryn S. Quick, Jodi R. 2017. "Learning to Facilitate: Implications for Skill Development in the Public Participation Field." In *The Professionalization of Public Participation*, Routledge.

- Schinasi, Leah H. et al. 2021. "Associations between Greenspace and Gentrification-Related Sociodemographic and Housing Cost Changes in Major Metropolitan Areas across the United States." *International Journal of Environmental Research and Public Health* 18(6): 3315.
- Schrock, Greg, Ellen M. Bassett, and Jamaal Green. 2015. "Pursuing Equity and Justice in a Changing Climate: Assessing Equity in Local Climate and Sustainability Plans in U.S. Cities." *Journal of Planning Education and Research* 35(3): 282–95.
- Schroeder, Krista et al. 2019. "Reconciling Opposing Perceptions of Access to Physical Activity in a Gentrifying Urban Neighborhood." *Public Health Nursing* 36(4): 461–68.
- Shaw, Kate S., and Iris W. Hagemans. 2015. "Gentrification Without Displacement' and the Consequent Loss of Place: The Effects of Class Transition on Low-Income Residents of Secure Housing in Gentrifying Areas." *International Journal of Urban and Regional Research* 39(2): 323–41.
- Shokry, Galia et al. 2021. "'They Didn't See It Coming': Green Resilience Planning and Vulnerability to Future Climate Gentrification." *Housing Policy Debate*: 1–35.
- Shokry, Galia, and Isabelle Anguelovski. 2021. "Addressing Green and Climate Gentrification in East Boston." *The Green City and Social Injustice: 21 Tales from North America and Europe*.
- Shokry, Galia, Isabelle Anguelovski, and James Connolly. 2018. "Uneven (Green) Landscapes of Resilience and Protection: Climate Gentrification in Urban Climate Adaptation."
- Shokry, Galia, James JT Connolly, and Isabelle Anguelovski. 2020. "Understanding Climate Gentrification and Shifting Landscapes of Protection and Vulnerability in Green Resilient Philadelphia." *Urban Climate* 31: 100539.
- Siders, A. R. 2019. "Social Justice Implications of US Managed Retreat Buyout Programs." *Climatic Change* 152(2): 239–57.
- Sieg, Holger, V. Kerry Smith, H. Spencer Banzhaf, and Randy Walsh. 2004. "Estimating the General Equilibrium Benefits of Large Changes in Spatially Delineated Public Goods*." *International Economic Review* 45(4): 1047–77.
- Smith, Kylie M. 2011. "The Relationship between Residential Satisfaction, Sense of Community, Sense of Belonging and Sense of Place in a Western Australian Urban Planned Community."
- Smith, Neil. 1987. "Gentrification and the Rent Gap." Annals of the Association of American Geographers 77(3): 462–65.
 - ———. 2002. "New Globalism, New Urbanism: Gentrification as Global Urban Strategy." Antipode 34(3): 427–50.

- Sohn, Wonmin, Hyun Woo Kim, Jun-Hyun Kim, and Ming-Han Li. 2020. "The Capitalized Amenity of Green Infrastructure in Single-Family Housing Values: An Application of the Spatial Hedonic Pricing Method." *Urban Forestry & Urban Greening* 49: 126643.
- Sreetheran, Maruthaveeran, and Cecil C. Konijnendijk van den Bosch. 2014. "A Socio-Ecological Exploration of Fear of Crime in Urban Green Spaces – A Systematic Review." Urban Forestry & Urban Greening 13(1): 1–18.
- Stodolska, Monika, and Konstantinos Alexandris. 2004. "The Role of Recreational Sport in the Adaptation of First Generation Immigrants in the United States." *Journal of Leisure Research* 36(3): 379–413.
- Su, Shiliang et al. 2021. "Do Landscape Amenities Impact Private Housing Rental Prices? A Hierarchical Hedonic Modeling Approach Based on Semantic and Sentimental Analysis of Online Housing Advertisements across Five Chinese Megacities." *Urban Forestry & Urban Greening* 58: 126968.
- Triguero-Mas, Margarita et al. 2015. "Natural Outdoor Environments and Mental and Physical Health: Relationships and Mechanisms." *Environment international* 77: 35–41.
 - ------. 2022. "Exploring Green Gentrification in 28 Global North Cities: The Role of Urban Parks and Other Types of Greenspace." *Environmental Research Letters*.
- Triguero-Mas, Margarita, Mario Fontán-Vela, and Taliah Dommerholt. 2021. "Can Community Mobilization Be Inclusive of the Black Community in Its Fight against Green Gentrification?" *The Green City and Social Injustice: 21 Tales from North America and Europe*: 21.
- Veerkamp, Clara J. et al. 2021. "A Review of Studies Assessing Ecosystem Services Provided by Urban Green and Blue Infrastructure." *Ecosystem Services* 52: 101367.
- Versey, H. Shellae. 2022. "Gentrification, Health, and Intermediate Pathways: How Distinct Inequality Mechanisms Impact Health Disparities." *Housing Policy Debate*: 1–24.
- Voelkel, Jackson, Dana Hellman, Ryu Sakuma, and Vivek Shandas. 2018. "Assessing Vulnerability to Urban Heat: A Study of Disproportionate Heat Exposure and Access to Refuge by Socio-Demographic Status in Portland, Oregon." *International Journal of Environmental Research and Public Health* 15(4): 640.
- Wamsler, C. et al. 2020. "Environmental and Climate Policy Integration: Targeted Strategies for Overcoming Barriers to Nature-Based Solutions and Climate Change Adaptation." *Journal Of Cleaner Production* 247.
- Wilson, Barbara. 2018. "Cully, Portland: Green Infrastructure as an Antipoverty Strategy." In *Resilience for All*, Springer, 141–67.

- Wolch, Jennifer R., Jason Byrne, and Joshua P. Newell. 2014. "Urban Green Space, Public Health, and Environmental Justice: The Challenge of Making Cities 'Just Green Enough." *Landscape and Urban Planning* 125: 234–44.
- Wu, Jiansheng et al. 2015. "Impact of Urban Green Space on Residential Housing Prices: Case Study in Shenzhen." *Journal of Urban Planning and Development* 141(4): 05014023.