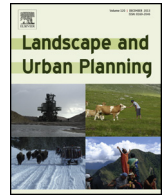




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## A social–ecological assessment of vacant lots in New York City

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### H I G H L I G H T S

- Sixty-seven percent of surveyed vacant lots are used for public, private or commercial purposes.
- Surveyed lots which are unused are largely located in areas of high population density and low income.
- Sixty-two percent of surveyed vacant lots are covered by trees and other herbaceous vegetation.
- Vegetated vacant lots are spatially clustered and correlated with neighborhood green space.
- Fine-scale classification can support planning for vacant lot management and development.

### A R T I C L E I N F O

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### A B S T R A C T

Land vacancy is a persistent phenomenon in urban landscapes in the United States, yet little is known about the ways vacant lots are used in practice and the functions they serve in local communities. Here, we offer insight into the composition, uses and neighborhood context of vacant lots in New York City. Using ArcGIS and Google Earth, we conducted a visual survey of 5% of vacant lots in each New York City borough, collecting land cover and actual use data. Results indicate that many vacant lots in New York City are used as community gardens, residential yards, parks, parking areas and sports fields. Neighborhood income and lot vegetation are significantly associated with most of the ways that vacant lots are used in practice. In particular, lots which are actually unused (33%) tend to be located in neighborhoods with relatively high population density and low median household income levels. We suggest that by assessing vacant lot uses, ecological characteristics and the social characteristics of neighborhoods in which vacant lots are located, planners may be able to more effectively address urban land vacancy while supporting urban sustainability and resilience.

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### 1. Introduction

Urban vacant land comes about through a variety of urban processes, including demographic and preference-based residential shifts, suburban expansion, de-industrialization and work force relocation. Vacant lots are often viewed as a problem in urban areas. Associated with crime, underutilization of land, abandonment, depressed real estate values, trash, overgrown weeds, vermin and general economic and social failure, they are thought to have a negative impact on community vitality (Accordino & Johnson, 2000; Goldstein, Jensen, & Reiskin, 2001). However, vacant lots may also be viewed as places in the urban landscape that serve

community needs or hold opportunity for land use transformations which can contribute to community development and provide ecosystem services that support the health and wellbeing of people (Burkholder, 2012; Little, 2008). The cumulative experience of many United States cities suggests that vacant lots are a common, lasting phenomenon which represent a substantial proportion of the urban landscape and can be strategically used in urban development policy (Bowman & Pagano, 2004). To inform planning and decision-making processes addressing urban land vacancy, it is imperative that we build a knowledge base about the characteristics of vacant lots, the types of uses they serve and their potential for social–ecological transformation through strategic urban planning and development.

In New York City (NYC), while some information is available about administrative aspects of vacant lots – such as zoning, location, and ownership – little is known about their landcover or how they are used. In this paper, we assess characteristics of NYC vacant lots to understand how they contribute to ecological processes, how

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**Table 1**  
Review of vacant lot census data collected between 1955 and 1997.

Number of cities sampled	City population size	Land vacancy (%)	Source
12	>100,000	>20%	Bartholomew (1955)
48		~20%	Niedercorn and Hearle (1964)
86	>100,000	20%	National Commission on Urban Problems (1968)
37	>250,000 <sup>a</sup>	12.5%	National Commission on Urban Problems (1968)
86	>100,000	20–25%	Northam (1971)
99	>100,000	19%	Bowman and Pagano (2000)
20	>250,000 <sup>a</sup>	15%	Bowman and Pagano (2000)

<sup>a</sup> Gray highlights indicate surveys that were conducted in cities of similarly large population size (>250,000 people).

they are actually used by communities currently, and the social context in which they are located. We posit that vacant lots are part of the infrastructure for social and ecological processes in the city and can be utilized for the co-improvement of social and ecological conditions in communities through green infrastructure development.

### 1.1. Vacant lots in large cities

The persistent existence of vacant lots in the urban landscape has been a reality in American cities for many decades (Schukoske, 2000). There is no single, broadly recognized definition of vacant land, but typically included in this category are bare soil, agriculture at the edge of an urbanized area or uncultivated land, recently razed land, derelict land, land with abandoned buildings and structures, brownfields, and greenfields (Bowman & Pagano, 2004; Pagano & Bowman, 2000). Northam (1971) offers a typology of vacant land which includes (1) remnant parcels, having small size or irregular shape; (2) land having physical limitations to development (steep slopes, flood hazards); (3) land in corporate reserve (e.g. owned by utility companies for future expansion); (4) land held for speculation and (5) land in institutional reserve. In practice, definitions of vacant land are established by cities, and so vary among jurisdictions. The classification may be influenced by a city's tax structure and development plan, to include parcels with zero-dollar building value or city-owned surface parking lots (Bowman & Pagano, 2004). The American Planning Association (APA) provides two definitions of vacant land. Citing the California Planning Roundtable, vacant land is defined as "lands or buildings that are not actively used for any purpose," or, cited from Leesburg, Virginia, "a lot or parcel of land on which no improvements have been constructed" (Davidson & Dolnick, 2004). In NYC, the Department of Finance defines a vacant lot as a parcel of land "on which no lawful structure exists and which is not otherwise being used for any purpose for which it may lawfully be used" (City of New York, 2010), combining concepts from both APA definitions. These descriptions provide little information about how vacant land might be incorporated into planning strategies. For instance, land on which no structure exists could be held in corporate reserve or have physical limitations to development. The former is awaiting development, while the latter may not be able to support building structures; yet, the vacant land class encompasses both meanings. There is relatively little literature on vacant land in United States cities; systematic census data, tracking supply of vacant land at the national level, was first collected in the mid-1950s during suburban expansion, and has been infrequently updated. The most recent comprehensive study of vacant lots in U.S. cities was conducted between 1997 and 1998, by surveying planning directors in U.S. cities with populations of 50,000 or more (Bowman & Pagano, 2004). The survey response rate was 35%, suggesting that in many places, vacant land supply is systematically tracked at the city-level. The average percentage of vacant land in cities of comparable population sizes has remained relatively constant over time. Vacant land in cities of more than

100,000 people has varied between 19 and 25% of total land area, while for cities with populations greater than 250,000, vacant land has comprised between 12.5 and 15% of total land area. Table 1 summarizes vacant lot census data collected between 1955 and 1997.

Bowman and Pagano (2004) found that cities which gained population reported more vacant land area than cities experiencing population loss. On its face, this evidence appears at odds with recent experiences of some post-industrial U.S. cities, where population decline has occurred alongside vast land abandonment at the urban core. In cities such as Detroit, Michigan, Youngstown, Ohio and Buffalo, NY, vacancy has come at the heels of population shrinkage (Popper & Popper, 2010). One explanation for this apparent discrepancy is that vacant land in growing cities is acquired through annexation at urban peripheries, while shrinking cities experience vacancy at their core. Indeed, Bowman and Pagano (2004) found that a city's ability to expand its territory was a significant predictor of that city's proportion of vacant land, implying that annexation is being used to maintain a supply of vacant land for future development. Their survey data also suggests that size, shape, and the assembly of land are the conditions that most limit vacant land redevelopment. To avoid a blighting influence on the surrounding community, undevelopable vacant land and vacant land awaiting development could serve long-term or interim beneficial uses such as community gardens, wildlife gardens, public plantings and recreational areas (Bonham, Spilka, & Rastorfer, 2002).

Historically, strategies to green vacant land for neighborhood improvement purposes have been enacted through a variety of policy mechanisms. Gardening on vacant lots has been facilitated through Vacant Lot Cultivation Associations encouraging the poor to grow food for sale and self-consumption (Lawson, 2005), land trust lease and acquisition programs enabling communities to maintain gardens (Bonham et al., 2002), Cooperative Extension support for food production in underserved neighborhoods (Lawson, 2005), side-lot or "abutter" programs enabling residents to manage land between buildings that would otherwise stand vacant, as well as a more recent integration of community gardening and urban agriculture into sustainability planning processes (City of Philadelphia, 2010; Colasanti & Hamm, 2010; Seattle Department of Neighborhoods, n.d.). Vacant land conversion projects that have been components of city or urban community comprehensive plans have also included waterfront park development, the development of greenways used as bike or pedestrian paths along railroads or abandoned industrial sites, and the creation of city gateways (Bonham et al., 2002; City of Pittsburgh, 2012; The Greening of Detroit, 2012). At the federal level, funds from the Community Development Block Grant program and the Neighborhood Stabilization Program are occasionally used to create public spaces on vacant land, in addition to rehabilitating housing structures and enabling homeowners to purchase vacant homes (DeGategno, Kasper, Kremer, Lampton, & Quinn, 2010; US HUD, n.d., 2009). Cities that have been significantly

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