Gentrification in the wake of a hurricane: New Orleans after Katrina

Eric Joseph van Holm
School of Public Affairs, Center for Science, Technology and Environmental Policy Studies, Arizona State University, USA

Christopher K Wyczalkowski
Urban Studies Institute, Georgia State University, USA

Abstract
Hurricane Katrina struck the city of New Orleans in August of 2005, devastating the built environment and displacing nearly one-third of the city’s residents. Despite the considerable literature that exists concerning Hurricane Katrina, the storm’s long-term impact on neighbourhood change in New Orleans has not been fully addressed. In this article we analyse the potential for Hurricane Katrina to have contributed to patterns of gentrification during the city’s recovery one decade after the storm. We study the association between Hurricane Katrina and neighbourhood change using data on the damage from the storm at the census tract level and Freeman’s (2005) gentrification framework. We find that damage is positively associated with the likelihood of a neighbourhood gentrifying in New Orleans after one decade, which drives our recommendations for policy makers to take greater concern for their communities during the process of rebuilding from storm damage.

Keywords
displacement/gentrification, Hurricane Katrina, inequality, local government, neighbourhood, New Orleans, social justice

Received May 2018; accepted August 2018
Introduction

Hurricane Katrina struck the city of New Orleans and surrounding communities with Category-1 strength winds in August of 2005, resulting in damage to over 200,000 homes and the displacement of 800,000 individuals. The costliest storm in the United States’ history at that time, meant the emergency response, recovery and reconstruction cost over US$100 billion (Hoople, 2013). And yet, despite the extensiveness of the response, one year after Hurricane Katrina the population of New Orleans was barely a third of what it had been during the 2000 Decennial Census (Fussell, 2015).

As the years passed, Hurricane Katrina came to symbolise a shared identity for those taking part in the recovery (Chamlee-Wright and Storr, 2009; Gratz, 2015), but it also left substantial physical marks on the city. The US Army Corps of Engineers (2009) recommended that large sections of the flooded areas not be rebuilt because of the potential for flooding from future storms, and indeed some sections of the city still remain urbanistically fallow. It has taken numerous neighbourhoods over a decade to repair, and the lingering damage and devastation has become part of a cottage industry in tourism for visitors to explore blighted areas as well as help in the cleanup (Breunlin and Regis, 2008; Pezzullo, 2009).

The devastation from Hurricane Katrina has inspired a substantial literature on the storm’s impact, both on the physical damage to the city as a whole, as well as on the inequitable recovery reported in some New Orleans neighbourhoods. For instance, Frey and Singer (2006) found that following the storm, minority, low-income households were far more likely than higher-income households to have left the city, as a result of the damage and public service disruptions. The damage was found to have been greater in low-income neighbourhoods, and the storm’s effects fell disproportionately on African-Americans, renters and the unemployed. Finch, Emrich and Cutter (2010) found that a few years after the storm there were clear disparities in the recovery, and that residents in less vulnerable neighbourhoods were returning to the city and having their communities rebuilt more quickly. While nearly the entire city was temporarily displaced after the storm, white residents returned more quickly, with the caveat that this was caused more by differences in housing damage than by race (Fussell et al., 2010; Groen and Polivka, 2010). However, as Fussell et al. (2010) suggest, the fact that communities of colour were more likely to live in low-lying neighbourhoods makes disentangling the impact of race on recovery complicated.

Despite the substantial body of literature on New Orleans and Hurricane Katrina, the storm’s long-term impacts on neighbourhood change have not yet been sufficiently assessed. Similarly, neighbourhood change literature does not adequately address the potential effects of damage from natural disasters on gentrification. In this article we test whether the damage from Hurricane Katrina impacted gentrification in the city of New Orleans one decade later. In the next section we review the existing literature on gentrification and disasters, with a particular focus on how these may apply to the case of New Orleans. We then identify the data and methodology used to test whether damage from Hurricane Katrina impacted neighbourhood change after one decade. We find that there is a positive association between the physical

Corresponding author:
Eric Joseph van Holm, School of Public Affairs, Center for Science, Technology and Environmental Policy Studies, Arizona State University, 411 N. Central Ave, Phoenix, AZ 85004, USA.
Email: evanholm@asu.edu
damage from Hurricane Katrina and the likelihood of a census tract gentrifying. After reviewing the results of our analysis, we conclude with a discussion of the policy significance of our findings to the interrelated issues of storm resilience and recovery at the neighbourhood level.

**Literature review**

The term gentrification, commonly found in both academic literature and popular media describing neighbourhood change, generally refers to a dramatic increase in the socio-economic status (SES) of a neighbourhood. However, there is no single accepted operationalisation of gentrification, and several measurements for the phenomenon exist in academic literature. Most commonly, gentrification is denoted by an increase in the housing prices of a neighbourhood or changes in the income, employment class or education of residents.

There are two prominent theories for the macro-level causes of gentrification. Gentrification has been theorised to be the result of a ‘back to the city movement’, whereby individuals desire to move towards urban amenities and take advantage of the low housing prices and locations closer to employment centres. Alternatively, the process is conceptualised as driven by developers, who have focused on the returns available from building in under-developed areas in the inner city (Smith, 1979). Of course, it is possible that both processes occur simultaneously. Beyond the macro causes of gentrification, it is often associated at least in the public’s mind with an influx of young, white and educated homeowners, and the specialty cafes, bars and restaurants that serve the new residents (Redfern, 2003).

Few studies have explicitly analysed whether natural disasters are a precursor for gentrification. The existing literature on long-term neighbourhood change resulting from natural disasters has shown mixed findings, evidencing the multifaceted and complicated nature of the process. For instance, Lee (2018) found that neighbourhoods with higher levels of damage experienced an increase in the poverty rate following a disaster, while after a 2011 tornado in Tuscaloosa, Alabama, Weber and Lichtenstein (2015) found evidence suggesting that less affluent areas showed little sign of change or recovery. Conversely, neighbourhoods in Talca, Chile, demonstrated signs of gentrification immediately following a 2010 earthquake according to Contardo, Boano and Wirsching (2018).

Most literature on gentrification focuses on the impact resulting from the introduction of a new amenity, be that a new transit station (Kahn, 2007), an improvement in environmental quality (Eckerd, 2011) or other factors that may attract residents to an area. However, a natural disaster may act as a disamenity for any specific location, because of both the threat of future recurrences and the cost of rebuilding from the physical damage. Further, extreme weather can act to exacerbate pre-existing differences in development. For example, Pais and Elliott (2008) have proposed the ‘recovery machine’ hypothesis, which argues that pre-disaster status governs post-disaster access to resources and recovery. That is, they propose that wealthy communities will be far less affected and recover faster from disasters than those having had low socioeconomic status before a storm. Significant damage could so depress an area’s value that it gets trapped in the ‘first mover impasse’, whereby developers avoid the area because of the density of neglect present. However, a natural disaster such as Hurricane Katrina may act in precisely the opposite direction and help to spur neighbourhood upgrading. One factor found to slow gentrification in certain neighbourhoods is the density of poverty, which can overwhelm any initial investments.
from government or the private sector and make escaping the neighbourhood-wide poverty trap more difficult. By creating widespread displacements and necessitating significant new construction (Sisk and Bankston, 2014), Hurricane Katrina may have provided a *terra nova* for developers.

To that end, developers and policy makers may have taken advantage of the opportunity created by the rebuilding of the city after Hurricane Katrina. With the incentive to increase the tax base, municipalities seek to create amenities for new residents, change the character of housing or otherwise transform neighbourhoods from their past condition to an upgraded state more likely to appeal to residents of a higher socioeconomic status. BondGraham (2007: 1) theorised that immediately after the storm New Orleans would see gentrification in devastated neighbourhoods, as part of ‘a Shumpeterian process’, because ‘local economic elites are seeking to make an opportunity of the destruction by monopolizing the planning process and rebuilding the cityscape in a fashion more amenable to the accumulation of capital’.

Such trends following Katrina have been identified in other policy arenas. For instance, following the storm, New Orleans witnessed the rapid introduction of market based reforms to the public education system, in part because of the ability of policy makers to do so with less input from residents (Buras, 2011; Klein, 2007). More directly related to neighbourhood change, Burns and Thomas (2015) found widespread reforms in New Orleans housing policy as part of the recovery from the storm, though commitments to serve low-income residents had not been fulfilled.

These changes are part of a broader trend transforming the city of New Orleans, both visibly and culturally. As a result of the greater capacity of white residents on average to recover from the storm, the city’s racial composition has shifted (Colten, 2008; Fussell et al., 2010). Along with a broader valuation of central city real estate, the culture of neighbourhoods has been transformed as these communities come to reflect their wealthier residents. Of course, that issue is not confined to New Orleans, but reflects the fraught racial issues implied by the term gentrification (Freeman, 2011; Hyra, 2017). While gentrification can be defined based on a neighbourhood’s socioeconomic status, in a city such as New Orleans any neighbourhood that is undergoing gentrification is highly likely to have originally had a large share of African-American residents, making the tangled issues of class and race inescapable in such a context (Gladstone and Préau, 2008; Gotham, 2005).

In view of the potentially uneven recovery of low-income communities after disaster, in this article we test whether neighbourhoods in New Orleans with higher levels of physical damage from Hurricane Katrina will be more likely to gentrify one decade after the storm.

**Study design**

**Case study description**

The analysis here considers the effect of damage from Hurricane Katrina on neighbourhood change in New Orleans. Founded near the confluence of the Mississippi River, Lake Pontchartrain and Lake Borgne (Figure 1), New Orleans was the largest and most important port in the Southern United States throughout the 19th century (Powell, 2012). The historic centre of the city, the French Quarter, remains a popular tourist destination, lying adjacent to the modern Central Business District (CBD) and the city’s downtown. Due to its location near the Gulf of Mexico, New Orleans has been repeatedly threatened by hurricanes, though the levee system generally protected the city
Figure 1. New Orleans.

Figure 2. Population trends.
from complete devastation until Hurricane Katrina.

The city of New Orleans continues, over a decade later, to rebuild from the damage wrought by Hurricane Katrina. As shown in Figure 2, the city’s housing and population have still not recovered to their pre-storm levels. While both measures continue to show steep declines overall following the storm, the housing stock was able to recover quicker than the city’s population despite the Great Recession.

Data

The impact of Hurricane Katrina can be better appreciated by observing micro-level changes to the city. Data on neighbourhood damage from Hurricane Katrina comes from open source files available from the City of New Orleans (2013) website. City inspectors conducted a post-Katrina damage assessment as part of the recovery efforts immediately after the storm, recording the extent of physical damage for multiple categories for each parcel. The data reported the percentage of physical damage to property as a whole for each parcel in the city. In this study the percentage of damage is summed and divided by the number of parcels in a given census tract to produce the key independent variable, representing property damage from Hurricane Katrina.

The parcel-level damage assessment was aggregated to census tracts in order to match it with demographic data from the US Census. To identify the effect that Hurricane Katrina had on neighbourhoods in New Orleans, we analyse census tracts within the city before and after the storm. We utilise data from the 2000 Census to identify the status of neighbourhoods prior to Hurricane Katrina, and five-year-ACS1 data from 2015 as a post-storm observation. Census tracts have long been used as a proxy for neighbourhoods and are the smallest geographical unit regularly available from the US Census. In order to maintain consistent population sizes over time and across the country, census tract boundaries may be adjusted every decade. While changing boundaries complicate longitudinal analyses, researchers at Brown University have released the Longitudinal Tract Database (LTDB), which transformed census tract data from 1970 to 2000 to the 2010–2019 geography using an aerial weighting technique (Logan et al., 2014). Thus, we are able to connect data from the LTDB version of the 2000 Census with data from the 2015 American Community Survey to observe neighbourhood change across a consistent geographical area.

Methodology

Urban studies literature does not currently provide a universally accepted operationalisation of gentrification, though the concept centres on the idea of low-SES neighbourhoods rising in status. The set of variables used to measure the phenomenon is generally shared across studies, including median rents, income, education and employment class, though the particular ones used in any study do vary. The pairing of distinct conditions to be eligible to gentrify with specific criteria to be considered gentrified is essential to the literature to establish a clear and comparable measure. Yet, many studies either ignore the need to specify what neighbourhoods are eligible to gentrify or accept any level of increase in SES as evidence of gentrification. In this analysis we utilise Lance Freeman’s (2005) framework to identify tracts that have gentrified by 2015, because it provides a definition of the term that encompasses both the pre-change conditions of the neighbourhood, as well as the transformations that must be observed. Specifically, Freeman’s
A quantitative definition of the term encompasses five criteria; a census tract must:

1. Be located in the central city of a metropolitan area;
2. Have a median income lower than the 40th percentile for the median income in the metropolitan area at the beginning of the study period;
3. Have a proportion of housing built within the past 30 years lower than the 40th percentile for the metropolitan area at the beginning of the study period;
4. Have an increase in the percentage of university graduates greater than the median increase in university graduates for that metropolitan area between periods;
5. Have an increase in real housing prices.

Using Freeman’s definition of gentrification, we conduct the analysis in two stages. First, to understand the overall pace and shape of gentrification throughout the city during the years studied, we utilise GIS to examine neighbourhood-level changes in the city. Employing Freeman’s definition, we analyse which tracts in the city of New Orleans were eligible to gentrify in 2000, and those that were gentrified by the year 2015.

In the second stage of the analysis we ask whether damage from Hurricane Katrina contributed to where gentrification occurred within the city using a variable that measures the share of houses within the tract that sustained damage from the storm. However, storm damage may have a nonlinear impact on a neighbourhood, so a squared term is included as well.

Because the tracts used in the second set of analyses are all eligible to gentrify, they held a similar level of socioeconomic status prior to the storm, and thereby reduce the need for the inclusion of additional control variables. Specifically, all tracts included in the second analysis are in the central city, and have a median income lower than the metropolitan area’s median and an older housing stock than the rest of the region; thus, it would be redundant to include these or other highly correlated variables in the regression. However, we do include the distance from the city centre and the percentage of the neighbourhood that is African-American in the models to control for aspects of New Orleans that may have shaped gentrification that are external to Freeman’s framework.

Like many other cities in the late 20th century, much of New Orleans’ redevelopment has been led by tourism (Robertson, 1995). The city’s historic downtown, positioned around the French Quarter, has been a prime tourism destination due to its historic architecture, adjacency to modern cultural amenities, and central location (Gotham, 2002). The ‘back to the city movement’ has begun to reverse the disrepair that followed suburbanisation, making these neighbourhoods chic and attractive to young professionals; while the damage of Hurricane Katrina may have provided a blank slate for redevelopment, location within a city, and specifically location relative to downtown, should positively predict gentrification. The importance of centrality to recovery in New Orleans was demonstrated by Wang, Tang and Wang (2014), who found a curvilinear pattern of population decline with distance from the CBD, with the largest declines occurring 4–6 km from the CBD. Thus, we include the distance from the Central Business District for each census tract to account for the centrality of its location.

While New Orleans was long a relatively integrated city owing to its history as a multi-cultural and multi-racial hub of transportation and trade, during the 20th century it became more segregated (Fischer, 1969; Powell, 2012; Spain, 1979). While the appearance of crime or an ‘authentic urban experience’ can be used as a resource for branding while redeveloping a neighbourhood (Hyra, 2017), segregation has a
complicated relationship with gentrification (Freeman, 2009). There is a long history of persistence in residential segregation, particularly in cities with fraught racial relations such as New Orleans (Quillian, 2002). Thus, we control for the pre-storm percentage of African-American residents in a neighbourhood, expecting that neighbourhoods that had a higher share of black residents will have been less likely to have gentrified.

Summary statistics for all variables used in the regression are listed below in Table 1. We use a logit regression because the dependent variable is whether each tract gentrified, and is thus dichotomous. In addition, we report robust standard errors to correct any issues of heteroskedasticity that may be present in the data.

Results

Patterns of change

Freeman’s framework contains three conditions that denote whether a neighbourhood is eligible to gentrify for its redevelopment to be considered for gentrification. First, the tract must reside within the central city limits of a metropolitan statistical area (MSA), which in our case left 176 of the 504 tracts in the New Orleans region. In addition, a tract must have a housing stock that is older than the rest of the region as well as a median household income below the 40th percentile for the MSA.

In the year 2000, 101 of the 176 tracts met all three criteria, as shown in Figure 3. Out of the 176 tracts in the city of New Orleans, 147 (84 per cent) had housing stock that were older than the 40th percentile for the MSA, while 111 (63 per cent) had median incomes below the 40th percentile. Tracts meeting all three criteria to be eligible to gentrify are shown in black.

We further observe that tracts that are eligible to gentrify are geographically concentrated. While the tracts that constitute the French Quarter, Central Business District and Garden District were not themselves eligible to gentrify, they are nearly surrounded by tracts that do qualify. Thus, tracts and neighbourhoods situated closer to downtown, but that are not themselves centres of the city’s burgeoning tourism and hospitality sector, continued to face underinvestment, while tracts further from downtown and closer to the outstretching suburbs of the city were able to maintain higher incomes and newer housing stocks. For instance, while every tract in Mid-City, immediately to the north-west of downtown, is eligible to gentrify, no tracts in the adjacent neighbourhood of Lakeview qualified. Stretching eastward from Mid-City is an uninterrupted band of tracts eligible to gentrify, while to the north and south-west the neighbourhoods are far more diverse and mixed in their socioeconomic conditions.

Two additional criteria delineate which tracts, of those that were eligible, gentrified by the year 2015. Specifically, those tracts needed to have an increase above the median change in college education for the region and have an increase in median housing prices after adjusting for inflation. Of the 101 tracts that were eligible to gentrify, 62 did so by 2015, as displayed in Figure 4.

Table 1. Summary statistics for regression.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gentrified</td>
<td>101</td>
<td>61.4</td>
<td>48.9</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Damage from Katrina</td>
<td>101</td>
<td>19.0</td>
<td>15.4</td>
<td>0.0</td>
<td>62.3</td>
</tr>
<tr>
<td>Distance to CBD</td>
<td>101</td>
<td>2.4</td>
<td>1.0</td>
<td>0.7</td>
<td>6.3</td>
</tr>
<tr>
<td>Percent Black in 2000</td>
<td>101</td>
<td>78.3</td>
<td>23.5</td>
<td>7.0</td>
<td>100</td>
</tr>
</tbody>
</table>
Many of the tracts sitting on the north side of the Mississippi River, on both the west and east sides of the city, did gentrify. The west side of the city had the highest rate of tracts gentrifying among those that were eligible, which may partially relate to the mixed nature of the socioeconomics of that area. In addition, a large share of tracts in the Mid-City area gentrified, though several tracts immediately adjacent to downtown failed to do so.

Katrina’s impact

With an understanding of the status and changes the city underwent from 2000 to 2015, we can now address the question of whether the damage from Hurricane Katrina had an impact on the likelihood of a neighbourhood gentrifying in the first decade since the storm. There has been substantial attention to the differential effect of Hurricane Katrina by socioeconomic class throughout the region, but within the city eligibility to gentrify does not appear to predict where the damage was the most substantial.

While the extensive damage to the Upper and Lower Ninth Ward is part of the memory of the event, other highly impoverished areas were missed by the worst of the storm. As shown in Figure 5, the north side of the city and the Lakeview neighbourhood sustained the greatest damage from Hurricane Katrina as the storm moved along Lake Pontchartrain. In fact, much of the city that

Figure 3. Gentrification categories and select New Orleans downtown neighbourhoods.
was situated closer to the Mississippi River witnessed less housing damage.

Table 2 evaluates the effect that Hurricane Katrina had on patterns of gentrification alone, as well as when controlling for the distance to the CBD and the percentage of African-Americans in the tract. With respect to our primary research question, regression results show that higher levels of property damage from Hurricane Katrina at the census tract level do positively predict gentrification. A one per cent increase in damage from the hurricane is associated with an increase of 0.13 in the log-odds of gentrifying when not controlling for any other factors. However, the effect of storm damage is non-linear; storm damage increases the probability of gentrifying, but at a decreasing rate as the damage rises.

The impact of Hurricane Katrina on neighbourhood change in New Orleans is largely consistent across model specifications. Accounting for the distance to the CBD has almost no effect on the coefficient for hurricane damage, and the centrality of each tract in the city is itself an insignificant predictor of gentrification. That result likely relates to the compressed nature of New Orleans owing to its location between several substantial bodies of water. In a more sprawling city or region, centrality may take greater importance.

Including the share of African-Americans along with the location of the tract enlarges the effect of a one per cent increase in storm
**Figure 5.** Damage.

**Table 2.** Where gentrification occurred.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gentrified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damage from Katrina</td>
<td>0.132**</td>
<td>0.131**</td>
<td>0.204***</td>
</tr>
<tr>
<td></td>
<td>(0.063)</td>
<td>(0.066)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>Damage squared</td>
<td>−0.005***</td>
<td>−0.005***</td>
<td>−0.006***</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Distance to CBD</td>
<td>−0.012</td>
<td>−0.387</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.283)</td>
<td>(0.348)</td>
<td></td>
</tr>
<tr>
<td>Percent African-Americans in 2000</td>
<td></td>
<td>−0.063***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.022)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.791*</td>
<td>0.817</td>
<td>5.996***</td>
</tr>
<tr>
<td></td>
<td>(0.425)</td>
<td>(0.808)</td>
<td>(2.118)</td>
</tr>
</tbody>
</table>

Robust Standard Errors | Yes | Yes | Yes
Observations         | 101  | 101  | 101
Log Likelihood       | −54.518 | −54.517 | −46.538
Bayesian Inf. Crit. | 122.882 | 127.495 | 116.151
Akaike Inf. Crit.   | 115.037 | 117.035 | 103.076

Notes: *p < 0.1; **p < 0.05; ***p < 0.01.
damage on the log-odds of gentrifying to 0.2. In addition, the variable for the percentage of African-Americans is significant and negative; a one per cent increase in the share of African-Americans decreases the log-odds of a tract gentrifying by 0.06, holding the location and amount of damage from Hurricane Katrina constant.

**Discussion**

One decade after Hurricane Katrina, New Orleans continues to be rebuilt, with the city still not having fully recovered from the physical damage left by the storm. In this article, we analysed whether damage from Hurricane Katrina in New Orleans positively correlated with a neighbourhood’s chances of having gentrified between 2000 and 2015. With a high degree of consistency across specifications, our models suggest that those neighbourhoods with a higher percentage of physical building damage from Hurricane Katrina were more likely to have gentrified one decade after the storm. Additionally, the likelihood of gentrification increases at a decreasing rate as the storm damage affects a larger share of parcels in a census tract. That additional finding indicates that the costs of rebuilding after the storm did not deter developers, but more significant physical damage may have redirected their efforts. These results add to a growing literature on the inequitable recovery occurring after natural disasters.

It may not be accidental which neighbourhoods are most affected by extreme weather, particularly in a case with the political and racial history of New Orleans (Gill, 1997). Following Hurricane Katrina, Neil Smith (2006: 1) argued that ‘there’s no such thing as a natural disaster’ because the patterns of harm are so directly influenced by the deliberate choices of policy makers. The decisions made in New Orleans, a city whose average elevation sits below sea level, would have dire consequences for the residents (Colten, 2008). These risks were exacerbated as the local economic elites and policy makers long privileged expansion of the port and economic growth, worsening the flood risks for the city (Youngman, 2015). Nelson and French (2002) found that high-quality land use plans helped to mitigate earthquake damage, demonstrating the ability of local governments to prevent disasters’ worst effects when they are committed and concerned.

Our findings may arise from something of a ‘squeaky wheel’ effect throughout the city during the recovery. Those neighbourhoods most damaged by Hurricane Katrina may have necessitated immediate infrastructure redevelopment, much of which would be paid for by government funds, paving the way for private developers to further reconstruct these neighbourhoods. Other neighbourhoods, seen as in less urgent need owing to their lower levels of damage, may have thus been skipped over in the early stages of redevelopment. For those neighbourhoods that were first redeveloped, the lack of housing supply elsewhere in the city likely drove up prices and contributed to gentrification pressures. Therefore, policy decisions related to the spatial and temporal appropriation of resources dictating which neighbourhoods to rebuild first, and the specific choices made of how to rebuild them, all point to the critical importance of policy choices in redevelopment from natural disasters, as well as the prevention of their impacts.

For a city as vulnerable to storm damage as New Orleans, the city was horribly ill-prepared for the physical effects and the recovery from Hurricane Katrina. The city’s evacuation plan relied on means that many residents lacked (Elder et al., 2007), and after the storm some evacuated residents lacked the ability to return. Plans for rebuilding the city left residents fighting to prevent the elimination of their communities (Storr and Haefele-Balch, 2012), and these residents continue to struggle to maintain
their neighbourhoods as gentrification alters them. Thus, Hurricane Katrina has exposed not just the shortfalls of planning for the immediacy following an emergency in New Orleans, but also the lack of foresight and commitment to protecting residents once recovery has commenced. The need to protect residents and prevent unnecessary disruptions to communities as part of rebuilding after a disaster is evidenced by the research here. Recovery involves significant political choices, and through other policy areas in New Orleans it is clear that the city was transformed by the storm in more than physical ways (Burns and Thomas, 2015; Johnson, 2011; Klein, 2007).

The role of gentrification in displacement remains hotly debated among researchers. For some scholars, displacement is an inherent part of the process (Slater, 2009), while other scholars have found that the increase in commercial activity and incomes is sufficient to help residents remain in place (Freeman and Braconi, 2004). These trends have been compounded with the growth of tourism, and with the related growth of short-term housing rentals such as Airbnb exacerbating housing shortages (Barron et al., 2018; Lee, 2016). Although our neighbourhood level unit of analysis only allows us to suspect displacement has taken place, other studies have pointed to it as a prominent issue in New Orleans. Future studies employing micro level observations may allow researchers to differentiate the effects from the storm and the recovery on the movement of residents throughout the city.

In addition to studying the migration and potential displacement of residents of New Orleans, the research here draws clear lines of future inquiry. The impact of a natural disaster on public input in policy making, from the perspective of both whether they are supposed to be included and if they are in fact consulted, is of particular interest. In addition, this case study should be expanded to other contexts and time frames. While this analysis focuses on changes in New Orleans one decade after Hurricane Katrina, future work can and should be completed using additional observations to understand the longer-term impacts of recovery. Discovering the divergences in recovery over time using longitudinal techniques such as latent growth curve regression will add further insight to understand the interaction of spending, physical damage and neighbourhood recovery. That would add to a growing, and mixed, literature on the impact of natural disasters on neighbourhood change. There may soon be a need to look across cases to try and identify the unique reasons that predict the direction of the change, offering greater insight to policy makers in preparing for the types of changes they can expect if a storm strikes their municipality.

As with any study of this nature, there are aspects of our data that produce limitations in our findings. First, we rely on the accuracy, or at least non-systematic error, in the rating of damage prepared by city inspectors. Secondly, the aerial weighting utilised by LTDB produces some measurement error. Any systematic bias in either of these measures may affect our results. Finally, there is the potential that a different operationalisation of gentrification would have altered the results, though we believe the framework used to be an accurate approximation of the concept. Alternative specifications might have changed the particulars of the results, but not the general direction of the findings, owing to the broad agreement within the literature on what constitutes gentrification.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.
Funding
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ORCID iD
Eric Joseph van Holm https://orcid.org/0000-0002-5741-6969

Notes
1. The 2015 five-year ACS is an aggregation of one-year ACS data from 2011 to 2015.
2. In Freeman’s original framework, the housing was less than 20 years old. However, the LTDB’s only includes a variable for housing that is 30 years or older, forcing us to change the criteria slightly.

References


