The Routledge Companion to the Suburbs

Edited by Bernadette Hanlon and Thomas J. Vicino

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2019
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data
Names: Hanlon, Bernadette, 1969– editor. | Vicino, Thomas J., editor.
Title: The Routledge companion to the suburbs / edited by Bernadette Hanlon and Thomas J. Vicino.
Description: Abingdon, Oxon ; New York, NY : Routledge, 2019. | Includes bibliographical references and index.
Identifiers: LCCN 2018018777 | ISBN 9781138290235 (hbk : alk. paper) | ISBN 9781315266442 (ebk)
Subjects: LCSH: Suburbs. | Suburban life.
Classification: LCC HT351 .R685 2019 | DDC 307.74—dc23
LC record available at https://lccn.loc.gov/2018018777

ISBN: 978-1-138-29023-5 (hbk)
ISBN: 978-1-315-26644-2 (ebk)

Typeset in Bembo
by Apex CoVantage, LLC
Printed and bound by CPI Group (UK) Ltd, Croydon, CR0 4YY

Contents

22

Shrinking suburbs in a time of crisis

Justin B. Hollander, Colin Polsky, Dan Zinder, and Dan Runfola

Introduction

In recent years, increased scholarly attention has been paid to the fall-out from the 2008 subprime lending debacle, a national collapse of the housing market that resulted in massive foreclosures and widespread housing vacancy throughout the United States (Immergluck, 2011; Hollander, 2009). Its effect on perennially growing areas such as Sunbelt cities and suburban living was unprecedented (Goodman, 2007; Leland, 2007; Dash, 2011). From Atlanta to Fort Meyers to Phoenix, massive new housing developments sat largely unoccupied while older housing sat abandoned due to foreclosure (Runfola and Hankins, 2010). With the housing market in a tailspin, cities in the Sunbelt faced depopulation and housing vacancy akin to that observed in the early stages of industrial Rustbelt cities' decline when their major industries began to falter.

It appeared that the Great Recession (the interval between 2006 and 2009) brought on a new era of shrinkage in formerly growing cities. In this chapter, we define shrinkage as net decline in occupied housing units. Lucy and Phillips (2006) note that decline in housing occupancy is a more meaningful indicator of decline than population loss, since the latter may indicate that units are being used differently rather than, for example, a community having more single or dual occupancy units where previously most units housed an entire family. In that instance, population decreases but the neighborhood has not necessarily experienced any destabilizing effects. The circumstances surrounding these new declines differ from Rustbelt population declines that date from the 1950s. In the Rustbelt, shrinkage has been driven by global economic conditions that pushed many manufacturing industries overseas – an economic trend unlikely to reverse in the near future. In contrast to this, the sun will always shine on the Sunbelt, likely driving an eventual return of the demand for retiree housing, even if tempered lending practices do not permit the same rate of consumption without capital.

Even if the circumstances around decline and shrinkage differ in these regions, we can still learn lessons from the Rustbelt about the process of shrinkage and the planning methods already undertaken in that region to encourage recovery. It has been suggested that once individual neighborhoods reach a certain threshold of vacancy, the likelihood of reversing that trend diminishes greatly (Hoyt, 1933; Wilson and Kelling, 1982; Wallace, 1989; Temkin and Rohe, 1996;

Keenan et al., 1999). Even as the United States as a whole recovers, individual pockets, neighborhoods, or regions that are still declining will likely persist in doing so, posing increasingly daunting challenges such as crime, poverty, depopulation, and ultimately revenue loss to local planners and policymakers.

As planners in this new group of shrinking places develop strategies to address decline, there is much they can learn from the emerging body of literature on smart shrinkage (Popper and Popper, 2002; Schilling and Logan, 2008; Hollander et al., 2009). Smart shrinkage is a set of policies that help areas with declining populations manage the associated land use changes. Instead of fighting population loss, smart shrinkage begins with the idea that maintaining a high quality of life for the remaining residents can be achieved without growth.

Central to smart shrinkage is recognizing the "fallibility of the myth of endless growth" (Popper and Popper, 2002, p. 23). Smart shrinkage was mentioned as early as 1989, when Clark encouraged preserving declining areas for "parkland and recreational spaces" (p. 143) – a suggestion echoed recently by Schilling and Logan (2008). Armborst, D'Oca, and Theodore (2005) introduced the idea of widespread acquisitions of vacant lots as a means of expanding average lot sizes and better managing shrinking populations, a process they described as "blotting."

A number of policymakers and lobbying groups have already implemented or considered smart shrinkage policies. Community leaders in Youngstown, Ohio, a city that has lost half of its population since 1950, adopted this approach with a new Master Plan to address its remaining population of 74,000. In the Plan, the city came to terms with its ongoing population loss and called for a "better, smaller Youngstown," focusing on improving the quality of life for existing residents rather than attempting to grow the city (City of Youngstown, 2005; Hollander, 2009; Schatz, 2010). In Philadelphia, the nonprofit Public/Private Ventures office issued a report calling for "the consolidation of abandoned areas and, in some cases, the relocation of those households that remain in blocks that too often look like Dresden after the Second World War" (Hughes and Cook-Mack, 1999, p. 15). City leaders in New Bedford, Massachusetts, and Rochester, New York have also explored the potential of smart decline (Goodnough, 2009; Fairbanks, 2010).

As shrinkage spreads beyond a handful of Rustbelt capitals, the smart shrinkage approach may gain increasing prominence in planning practice. Before studying smart shrinkage as a solution, however, planners need to better understand the process of shrinkage. When places lose a sizable number of people, the first thing that changes is housing demand. Glaeser and Gyourko (2005) have demonstrated the durability of housing using economic analysis – that is, as people leave a place, homes do not leave in concomitant levels synchronously. In time, many factors will result in fewer occupied housing units, including abandonment, demolition, arson, or an unwillingness of landlords to lease their property.

In this chapter, we seek to understand the physical impacts of economic contraction on housing occupancy patterns before and after the Great Recession. Additionally, we ask whether or not different census-defined density-determined regions – urbanized areas, metropolitan statistical areas, and rural areas – were affected uniformly during economic contraction.

We answer these questions by exploring household residential delivery data acquired from the U.S. Postal Service for February of 2000, 2006, and 2011; these years roughly mark the beginning of the real estate boom, peak of the real estate market, and years of decline and instability in the housing market following that peak. These data contain household delivery counts for every zip code in the country. In analyzing this dataset, net changes in occupied housing by zip code were tabulated and mapped, and patterns of spatial clustering were explored using Global and Local Moran's I statistics and Local Indicators of Spatial Association (LISA).

The planning context

Planners and developers have, for decades, been caught up in a false dichotomy: when a community grows in population it prospers, and when its population declines it suffers. E. F. Schumacher challenged that false dichotomy in 1973 with his volume *Small is Beautiful*. Popper et al. followed with *Urban Nongrowth* in 1976. But the on-the-ground world of practice never really responded to those critiques, and the growth/decline dichotomy prevailed until just recently.

Now, some local officials are asking if their communities can thrive and improve while staying small or even declining in population. In many ways, it is out of desperation driven by the profound failure of economic development strategies to arrest decline in many urban areas over the last several decades. The infusion of public monies into new stadiums, job training centers, infrastructure, and new housing in cities big and small has had a positive effect on some cities, but not all. Called the "forgotten cities" by Hoyt and Leroux (2007), the power and success of economic turn-around by building additional infrastructure has simply not worked everywhere. In fact, there is evidence that economic development has failed to reverse structural economic conditions contributing to decline more often than it has succeeded (Schumpeter, 1934; Boyer, 1983; Logan and Molotch, 1987).

Urban population decline has a bad reputation. Beauregard's 2003 book *Voices of Decline* documented in fastidious detail the ways that the discourses of decline were developed and positioned in American culture. Beauregard concludes that modern society's drive for bigger, faster, more of everything required that population and employment loss in mid-twentieth century cities was to be viewed in antipode to the growth and vitality of the suburbs. Lucy and Phillips's 2000 work further illustrated the plight of suburbs facing disinvestment and decline. They argued that booming, growing suburbs were at the greatest risk for decline, because they generally lacked the sense of place that can continue to attract new residents. Lang and Lefurgy's 2007 "boomburbs" analysis found that these growing suburbs were a significant phenomenon; they found 53 such boomtowns – places at high risk for decline in the event of economic contraction.

Little is known about how the Great Recession affected growing places like "boomburbs": whether they lost housing, how pervasive that loss was, and whether it was geographically clustered or dispersed. As such, the Great Recession provides a useful natural experiment for studying how an economic crisis influences shrinkage.

Alternative methods of calculating neighborhood decline

Bowman and Pagano (2004) conducted an exhaustive study on this topic, seeking to understand the vacancy problem's extent. They administered written surveys to local officials and assembled a database of abandoned buildings and vacant lot counts across more than a hundred U.S. cities. Unfortunately, this survey-based method was proven unreliable when cross-checked against housing unit counts from the Decennial Census (Hollander, 2009). Local officials across the country use very different strategies to account for vacancy and abandonment, making the use of locally distinct administrative data sources a suboptimal approach for producing national generalizations (Bowman and Pagano, 2000). Hillier et al. (2003) examined Philadelphia's housing databases to track vacancy and abandonment data, but their systems are not interoperable, making comparative analysis practically impossible. Wilson and Margulis (1994) developed a similarly localized analysis in Cleveland. Runfola and Hankins (2010) conducted on-the-ground fieldwork in Atlanta to tally abandoned and derelict housing, but their method was time-intensive and thus only conducted in a limited number of census block groups.

Many remote-sensing and GIS-based studies have had some success measuring urban population change, examining areas experiencing growth throughout the duration of the studies (Weber and Puissant, 2003; Xiao et al., 2006; Yang and Lo, 2002). Examining urban shrinkage, Ryznar and Wagner (2001) attempted to study the effects of population decline but could only measure net change in forested and agricultural land, extrapolating their findings to housing and commercial land use changes. Banzhaf et al. (2007) explored shrinkage in Leipzig, Germany, but found that the necessary data to validate their findings was lacking.

While remote-sensing-based approaches suggest that urban change may one day be measured accurately by aerial and satellite imagery, the data and technical requirements can be out of reach for many planning departments, and widely replicable methodologies have not yet been developed. One possible solution is to reconsider some of the available data from the U.S. Decennial Census. Data from the census provides total counts of occupied housing units for neighborhood-level census tracts every 10 years. Each housing unit in the U.S. is classified as either occupied or vacant. If vacant, the Census Bureau devised several possible classifications to reflect different reasons including for sale, seasonal home, or a catchall category, "other vacant," which researchers use to indicate abandoned homes (Hollander, 2010).

The challenge of using this dataset to produce insights into events such as the economic downturn is the process of population movement unfolds on a continuous basis whereas the census is only collected every 10 years. Other census data sources, such as the American Community Survey, provide annual updates; however, the finest scale on which these housing occupancy data are released is the municipal level, making this option inadequate for a neighborhood-level analysis.

Methodological approach

Occupied housing units offer a clear and useful path for studying abandonment at a national scale. This study explores a relatively unstudied data source, the U.S. Postal Service Delivery Statistics, as an alternative to the more spatially and time constrictive datasets described in the previous section. Six days a week, every week of the year, USPS sends a postal worker to walk up and down nearly every street in America and collects data on total deliveries for each zip code. The USPS regularly releases datasets that provide information on occupied housing units for each U.S. zip code. When a postal worker determines that a housing unit has not been occupied for more than 90 days, the USPS removes the address from its active inventory, data which is aggregated to zip codes and made available on a monthly basis.

Basic tabulation

For this study, three USPS datasets were analyzed: February 2000, February 2006, and February 2011. Nearly all zip codes in the lower 48 states were included in the analysis. Two time intervals were selected for analysis: February 2000 to February 2006 and February 2006 to February 2011. The first interval corresponds with the housing boom in the decade's first half and the second interval corresponds with the approximate tipping point of the boom into the foreclosure crisis and recession.

Change for each time interval was calculated by subtracting total occupied housing at the beginning point of each interval from occupied housing at the interval's end. The later time intervals total households from the earlier time intervals (e.g., total households in Feb 2000 for zip code X subtracted from total households in Feb 2006 from that same zip code, produces a measurement of occupied housing change for the interval between 2000–2006, where a negative value implies shrinkage and a positive value implies population growth). Change in housing occupancy was measured nationally (see Table 22.1) and for each of the four major census regions: Northeast (see Table 22.2), South (see Table 22.3), Midwest (see Table 22.4), and West (see Table 22.5). Additionally, the national and regional datasets were divided into three sub-regions based on "urban-ness" to test the severity in which more densely populated urban cores were impacted relative to less densely populated suburban and rural areas. Because the census categorizes regions as "Urbanized Areas" and "Metropolitan Statistical Areas" by population density, we used these boundaries as a rough approximation of different components of the metropolitan region for our study. Areas outside of Metropolitan Statistical Areas were identified as "rural and small towns."

Data mapping

Zip codes were also mapped nationally to show zip codes with net gains and declines for each interval (see Figures 22.1 and 22.2). Data from Figures 22.1 and 22.2 were combined into a third

Table 22.1 Summary statistics for national zip code district housing occupancy

		*Urbanized Areas**	*Metropolitan Statistical Areas***	*Rural and Small Towns*	*Total*
Interval 1: 2000–2006	**Total Count of Zip Codes**	6686	12071	9855	28612
	Count of ZDHOs***	2000	1361	2250	5611
	Percentage ZDHOs	29.9%	11.3%	22.8%	19.6%
Interval 2: 2006–2011	**Total Count of Zip Codes**	6243	11447	9186	26906
	Count of ZDHOs	2239	1945	2425	6609
	Percentage ZDHOs	35.9%	17.0%	26.4%	24.6%
Change in ZDHOs		239	584	175	998
Adjusted Change in ZDHOs		256	616	188	1061
% Change in ZDHOs		12.8%	45.2%	8.3%	18.9%

** Within Metropolitan Statistical Areas*
*** Excluding zip codes located in Urbanized Areas*
**** Zip codes with a net decline in housing occupancy*

Table 22.2 Summary statistics for Northeastern zip code district housing occupancy

		Urbanized Areas	*Metropolitan Statistical Areas*	*Rural and Small Towns*	*Total*
Interval 1: 2000–2006	**Total Count of Zip Codes**	1918	1966	1298	5182
	Count of ZDHOs	434	185	170	789
	Percentage ZDHOs	22.6%	9.4%	13.1	15.2%
Interval 2: 2006–2011	**Total Count of Zip Codes**	1859	1874	1221	4954
	Count of ZDHOs	560	274	212	1046
	Percentage ZDHOs	30.1%	14.6%	17.4%	21.1%
Change in ZDHOs		126	89	42	257
Adjusted Change in ZDHOs		130	93	45	269
% Change in ZDHOs		30.0%	50.5%	26.3%	34.1%

Table 22.3 Summary statistics for Southern zip code district housing occupancy

		Urbanized Areas	*Metropolitan Statistical Areas*	*Rural and Small Towns*	*Total*
Interval 1: 2000–2006	**Total Count of Zip Codes**	2048	4788	3044	9880
	Count of ZDHOs	561	439	468	1468
	Percentage ZDHOs	27.4%	9.2%	15.4%	14.9%
Interval 2: 2006–2011	**Total Count of Zip Codes**	1889	4611	2863	9363
	Count of ZDHOs	621	579	553	1753
	Percentage ZDHOs	32.9%	12.6%	19.3%	18.7%
Change in ZDHOs		60	140	85	285
Adjusted Change in ZDHOs		65	145	90	301
% Change in ZDHOs		11.6%	33.1%	19.3%	20.5%

Table 22.4 Summary statistics for Midwestern zip code district housing occupancy

		Urbanized Areas	*Metropolitan Statistical Areas*	*Rural and Small Towns*	*Total*
Interval 1: 2000–2006	**Total Count of Zip Codes**	1504	3379	4169	9052
	Count of ZDHOs	660	480	1378	2518
	Percentage ZDHOs	43.9%	14.2%	33.1%	27.8%
Interval 2: 2006–2011	**Total Count of Zip Codes**	1395	3286	3941	8635
	Count of ZDHOs	679	766	1362	2807
	Percentage ZDHOs	48.7%	23.3%	34.6%	32.6%
Change in ZDHOs		19	286	-16	289
Adjusted Change in ZDHOs		20	294	-16	303
% Change in ZDHOs		31.0%	61.3%	-1.1%	12.0%

Table 22.5 Summary statistics for Western zip code district housing occupancy

		Urbanized Areas	*Metropolitan Statistical Areas*	*Rural and Small Towns*	*Total*
Interval 1: 2000–2006	**Total Count of Zip Codes**	1203	1925	1320	4448
	Count of ZDHOs	344	255	352	951
	Percentage ZDHOs	28.6%	13.2%	26.7%	21.4%
Interval 2: 2006–2011	**Total Count of Zip Codes**	1083	1681	1150	3914
	Count of ZDHOs	373	324	299	996
	Percentage ZDHOs	34.4%	19.3%	26.0%	25.4%
Change in ZDHOs		29	69	-53	45
Adjusted Change in ZDHOs		32	79	-46	51
% Change in ZDHOs		9.4%	31.0%	-13.1%	5.4%

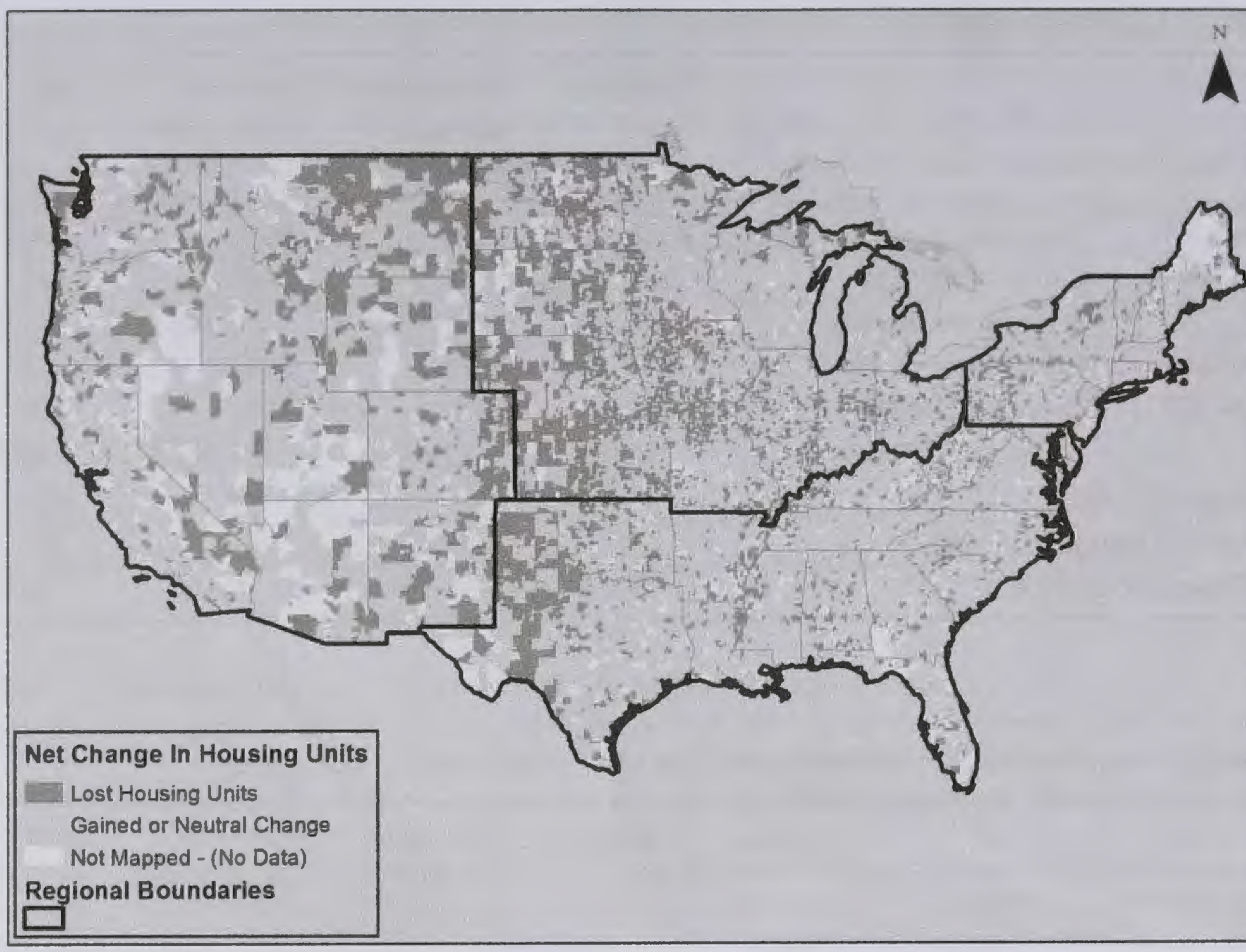

Figure 22.1 Change in occupied households 2000–2006

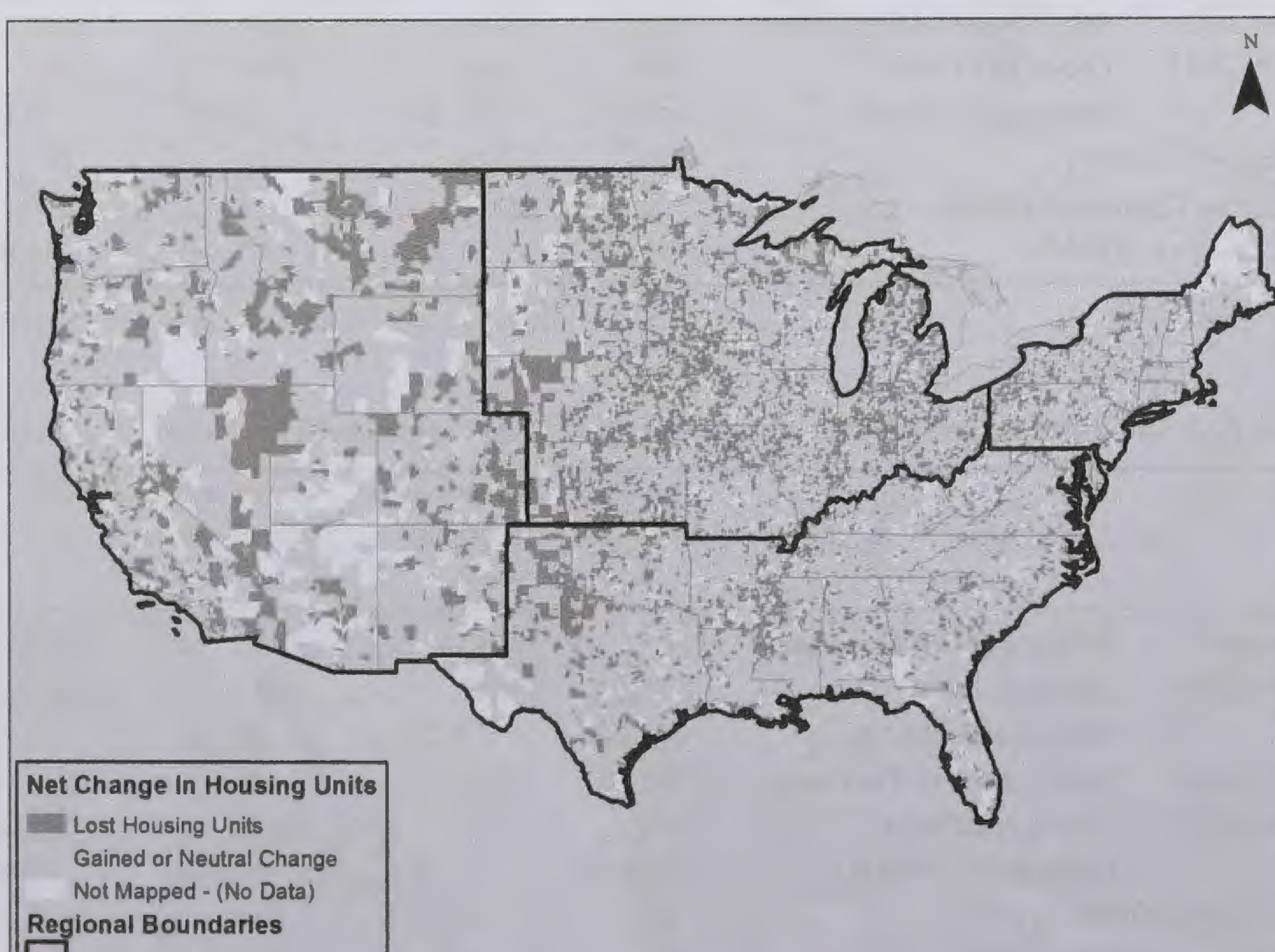

Figure 22.2 Change in occupied households 2006–2011

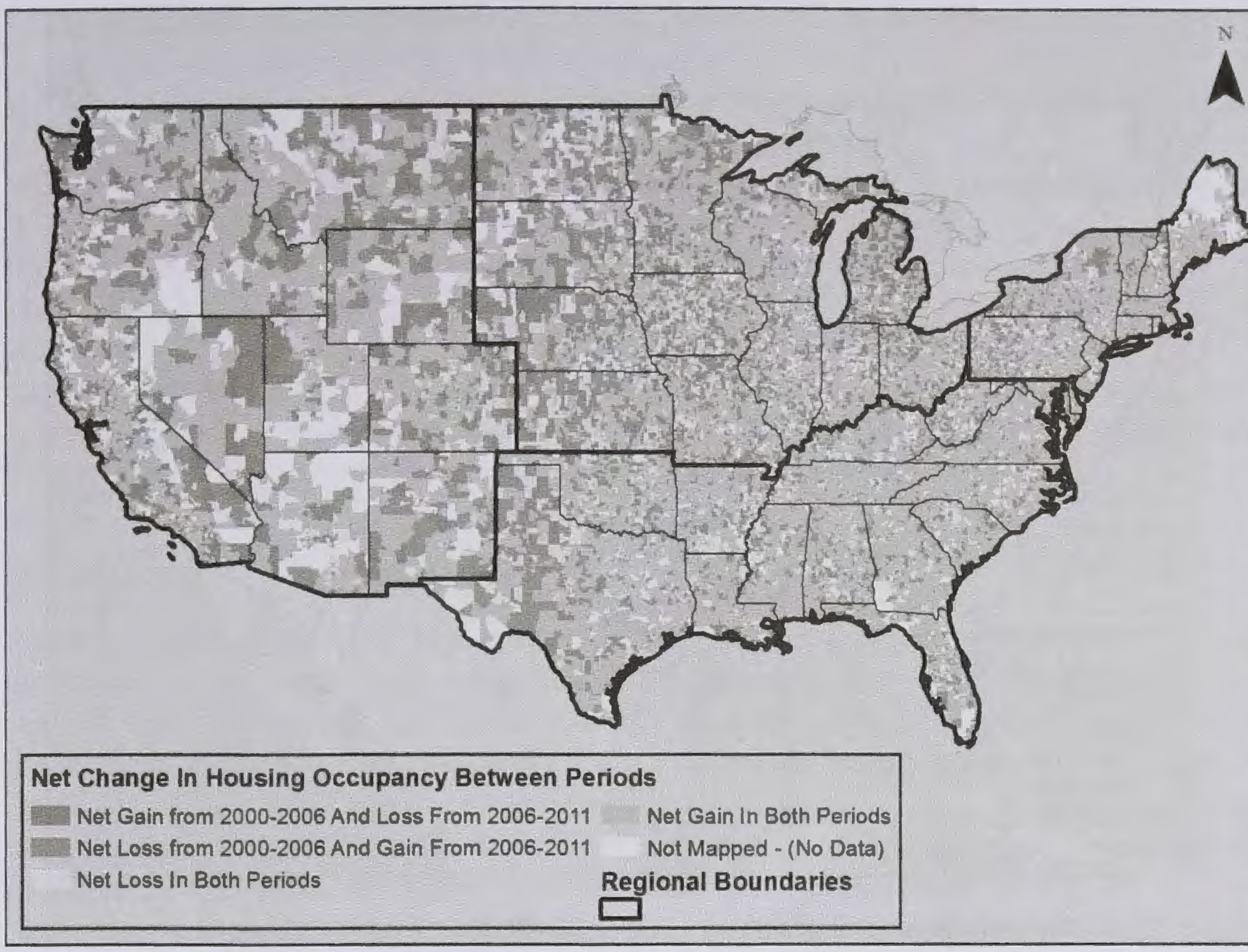

Figure 22.3 Occupied housing trends: comparing 2000–2006 with 2006–2011

national summary map (see Figure 22.3) showing trends over the full 11-year span by highlighting zip codes that declined in both intervals, Interval 1 only, and Interval 2 only.

To quantify severity of declines, maps were also created for all declining zip codes in each interval, showing what housing percentage was lost in these zip codes (see Figures 22.4 and 22.5). Declining zip codes from Interval 1 were divided into quartiles based on the percentage of the total housing stock lost during that interval. The quartile cutoff points for the first interval were applied to Interval 2 as well, to contrast how severe declines were for each interval.

Global and local indicators of spatial autocorrelation

Prior research has shown contagion effects for decline at the sub-neighborhood level (Harding et al., 2009). To test this, two univariate measures of spatial autocorrelation, Global Moran's I and a Local Indicator of Spatial Association (LISA), are used to explore spatial clustering of USPS Housing Unit Occupancy Change (cf. Anselin, 1995). These tests identify geographic clustering of zip codes showing statistically similar occupancy trends. Identifying adjacent declining clusters not only shows where "contagion effects" have been prevalent, but also elucidates "hot spots" of shrinkage (and growth) across the United States for each time interval.

The Global Moran's I analysis is employed to examine if household mail recipient losses and/or gains occurred in neighboring zip codes. Where the global statistic is statistically significant, the LISA analysis maps the clusters by partitioning them into groups of zip codes exhibiting anomalously high or low values, relative to the national mean.

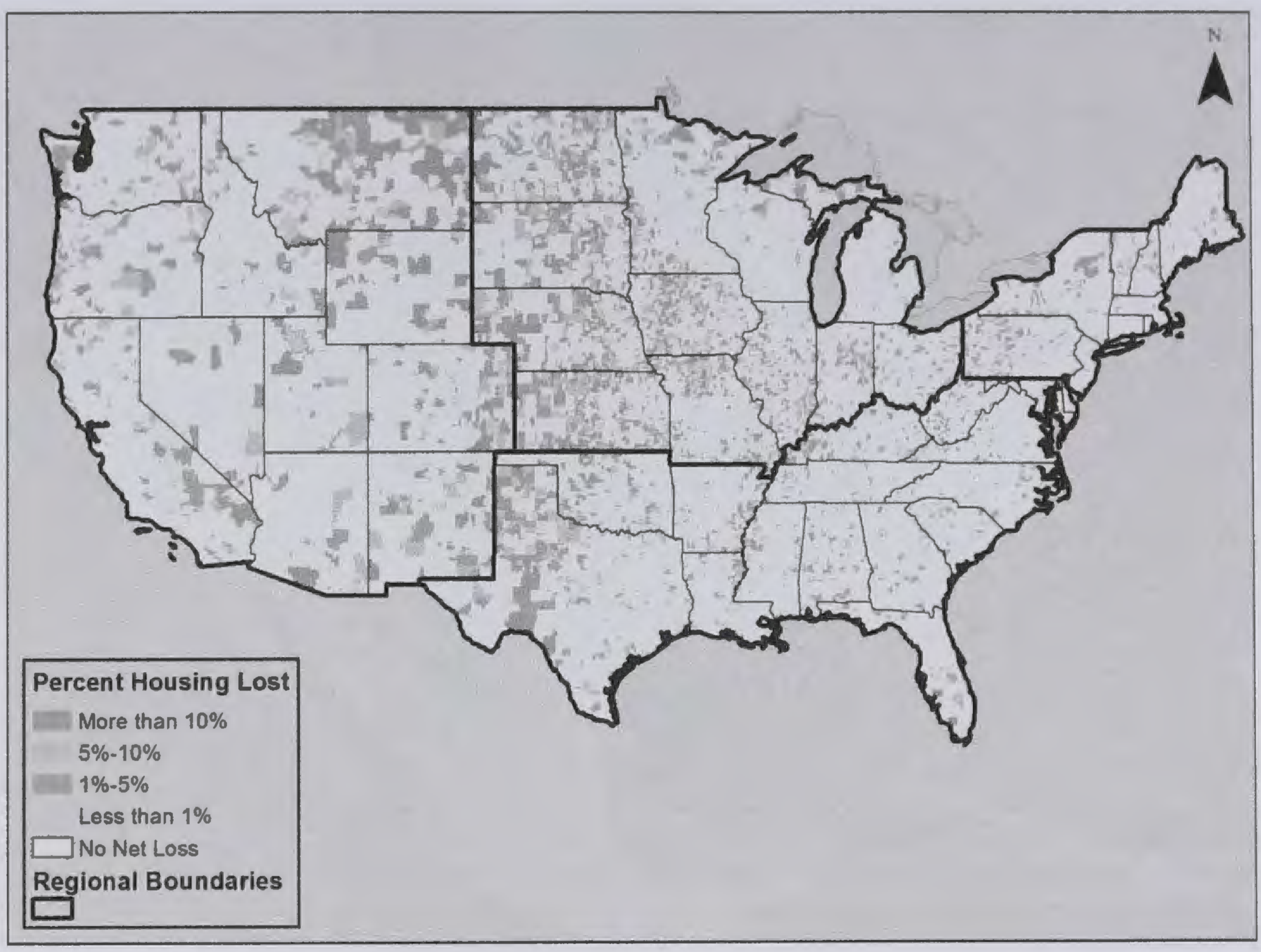

Figure 22.4 Percentage occupied housing lost 2000–2006

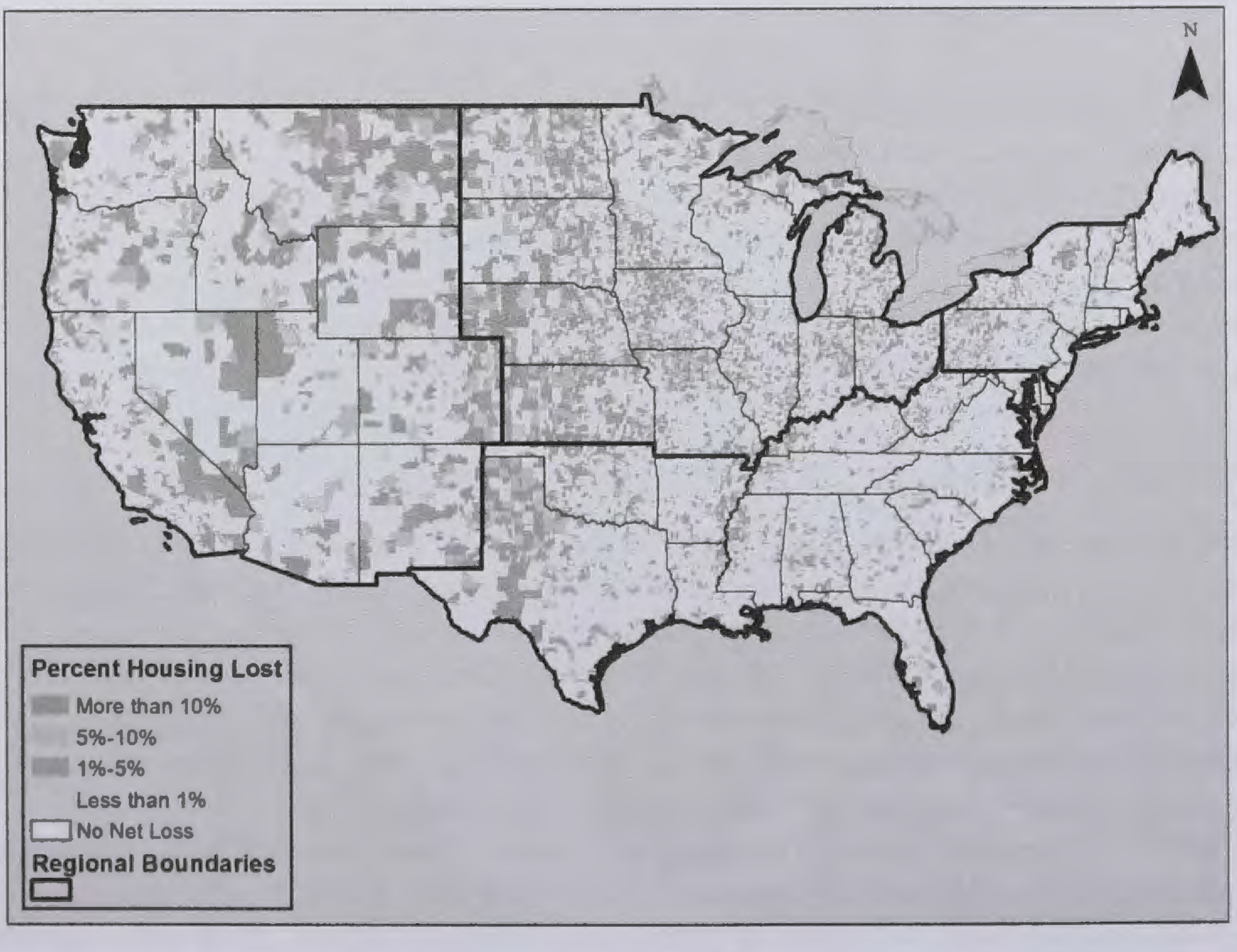

Figure 22.5 Percentage occupied housing lost 2006–2011

Each zip code in a cluster is labeled according to four possible categories in the LISA test:

1) High-High clustering – zip codes that experienced anomalously high growth surrounded by zip codes that also experienced anomalously high growth;
2) Low-Low clustering – zip codes that experienced anomalously high loss surrounded by zip codes that also experienced anomalously high loss;
3) Low-High clustering – declining zip codes surrounded by gaining zip codes;
4) High-Low clustering – gaining zip codes surrounded by declining zip codes.

Of these results, only low-low results, indicating homogeneous local clustering of zip codes anomalously below the national mean were mapped. Only zip codes that shared a border (the "Queen's" first-order contiguity matrix) were defined as being "neighbors."

Methodological considerations

Similar to remotely sensed and census data sources, using zip codes to measure urban shrinkage comes with a number of methodological concerns. Zip code boundaries occasionally change. In some cases, zip codes are eliminated; in other cases, two or more neighboring zip codes may be merged. In both cases, our calculations for such zip codes might indicate spurious losses or gains. Luckily, the Postal Service makes these changes available through their biweekly publication, *The Postal Bulletin*, enabling an analysis of how much these changes might impact analysis. Between 2000–2011, of the roughly 30,000 zip codes in the United States, roughly 130 zip codes on average changed boundaries per year. Any zip code that had a boundary change was omitted from the analysis.

Additional zip codes were omitted from the 2006–2011 interval in instances where the housing total went from a positive number in 2006 to zero occupied housing units in 2011. While it is conceptually possible that a zip code could lose its entire housing stock, our preliminary analysis identified 356 egregious cases where a zip code containing many housing units in 2006 – thousands in some cases – would be reduced to 0 in 2011.

In addition to these challenges, zip codes face many issues common to census, town, or otherwise zonal datasets. The number of occupied housing units within a zip code is a one-dimensional metric, and negative changes may be unrelated to neighborhood decline. For instance, a zip code could lose households if a new civic center is built and residences demolished or if multi-family homes are converted into single-family.

Findings

Absolute change in housing occupancy

This analysis of the USPS dataset revealed a number of trends that provide new and expanded insight into the spatial context in which we understand the Great Recession and subprime lending crisis' impact. Additionally, it provides a previously unavailable, imitable tool for periodic analysis of national and regional housing trends. As expected, more zip codes had a decline in occupied housing in the 2006–2011 interval than the 2000–2006 interval (see Table 22.1). Nationally, 998 more zip codes lost housing in the latter interval, resulting in a 19.6 percent increase in declining zip codes over the previous interval.

Each of the national sub-regions examined in this study experienced an increase in Zip Code District Housing Occupancy (ZDHOs) in the second interval. However, the magnitude of that change was not uniform across urban areas. In both intervals, Urbanized Areas had the highest percentage of ZDHOs, rural areas and small towns the second highest, and Metropolitan Statistical Areas the lowest. However, Metropolitan Statistical Areas had far and away the largest increase in ZDHOs in the second interval. The finding that less densely populated sections of metropolitan areas outside of the urban core showed the greatest percentage change in ZDHOs was consistent with findings limited to the subdivision of Urbanized Areas (Zinder, 2009).

All four of the regions examined experienced an increase in ZDHOs. The Midwest had the greatest overall percentage of ZDHOs in both intervals, followed by the West, Northeast, and South, respectively. However, the West and Midwest had the smallest percentage increase of ZDHOs between the two intervals. The Northeast had the greatest percentage increase in ZDHOs. The two largest subregion percentage changes in ZDHOs occurred within Metropolitan Statistical Areas in the Midwest and Northeast, respectively. The only two sub-regions that did not show an increase in ZDHOs were Midwestern and Western Rural and Small Towns. The second interval was not only notable for an overall increase in ZDHOs but also for an increased migration in the distribution of ZDHOs from urban centers into suburban and exurban areas.

Comparing spatial distribution of ZDHOs between intervals

Only 9.3 percent of zip codes nationally declined in both intervals (see Figure 22.3). The majority of the ZDHOs only declined in one of the intervals, with 11.1 percent of zip codes nationally only declining in the first interval and 15.2 percent of the zip codes only declining in the second interval. The Midwest had the most continuity between the two intervals, but each region showed volatility in new areas for the second interval. Thus, the second interval was not only marked by a general increase in ZDHOs, but by a widespread number of zip codes and regions whose housing occupancy reversed from growth to decline. Conversely, many previously declining regions, notably the High Plains and Pacific Northwest, began to see reversal patterns towards growth in the second interval.

Magnitude

While the second interval has been thus far characterized as having more widespread and new instances of decline, the first interval was better characterized as having the sharpest declines. Housing occupancy of 50 percent of all ZDHOs declined by more than 3.5 percent in the first interval whereas only 29.9 percent declined at that rate in the second interval. These trends were fairly consistent regionally for the first interval with the Midwest and South, as well as rural and small towns experiencing slightly disproportionate numbers of ZDHOs that lost over 3.5 percent of their housing stock. Regions with a high number of zip codes that declined only in the second interval tended to have a high percentage of ZDHOs with housing occupancy losses below 1.4 percent.

Global Moran's I and LISA

The results of the Moran's I global autocorrelation test indicated gaining and losing zip codes tended to cluster on the landscape. This was true in both time intervals, with Moran's I results 0.16 ($p < 0.05$) for the 2000–2006 interval and 0.24 ($p < 0.05$) for the 2006–2011 interval. This prompted us to perform a Local Indicator of Spatial Autocorrelation (LISA) to determine where this spatial clustering occurred. These results are seen in Figures 22.3 and 22.4, focusing only on statistically significant ($p < 0.05$) zip codes that had a net loss of occupied households.

Dark red areas show zip codes that experienced high losses of people receiving mail (relative to all zip codes) for a time interval, surrounded by other zip codes that also experienced high loss.

Centralized (clustered) housing loss occurred in both intervals; however, similar to ZDHO distribution, clustering patterns differed greatly between the two intervals. Clusters in the Great Plains, Mississippi and Missouri valleys, and along the Great Lakes stand out in the first interval. Clustering along the Great Lakes and in the Phoenix Metro area expanded in the second interval and popped up in Sun Belt metropolitan areas such as Las Vegas, Tampa, Miami, throughout California, and (for different reasons), New Orleans.

Conclusion

This research shows that the distribution of housing occupancy declines shifted between the 2000–2006 interval and the 2006–2011 interval. Many areas that previously exhibited perennial growth, particularly low-density suburban and exurban areas, and real estate-fueled markets in the Sun Belt, began to experience the initial stages of unoccupied housing challenges previously associated solely with centralized, densely populated urban areas. While housing occupancies have continued in many urban cores, particularly those within the Rust Belt and Great Plains, the rate and centralization of housing loss in these regions has tempered. Conversely, declines in lower-density areas across the United States and Sun Belt cities have not spiraled to the same extent that urban cores did in the late twentieth century. However, declines in these areas have become widespread.

Through the lens of housing occupancy, this chapter serves to initiate a first step in developing a methodological approach to identifying vulnerable neighborhoods and regions in a timely and accurate manner, and it further addresses a critical indicator of neighborhood health.

Understanding the scale and scope of housing unit declines throughout the United States contributes to the growing literature on smart shrinkage. The findings here lay a foundation for planners to begin to measure, and in turn manage, the physical changes that are occurring in their communities due to shrinkage. Additionally, the potential exists for USPS data to assist communities and RPOs in monitoring and analyzing shrinking areas within their boundaries.

Determining where these shrinkage hot spots are can aid planners and policymakers in developing tailor-made smart shrinkage strategies. For example, zip codes with high levels of shrinkage could be targeted for land banking, housing demolition, community-based agriculture, or expanded park systems. Additionally, such places might be receptive to a new form of zoning: relaxed zoning. Relaxed zoning addresses the fundamental economic problem in shrinking cities: excess supply of structures (housing, stores, schools) relative to demand (the number of people) (Hollander, 2011). Falling demand for housing will result in falling rents and house values (Hoyt, 1933; Temkin and Rohe, 1996). As prices fall, the ability to sell is impaired (especially if the mortgage exceeds the value of the property). As prices fall, the ability of landlords to recoup the costs of protecting and maintaining their properties in rents is likewise compromised (Keenan et al., 1999). A spiral of declining values, disinvestment, and deteriorating housing stock typically destroys stable neighborhoods and spreads dereliction (Bradbury et al., 1982).

This chapter examined, at the national scale, the patterns of urban growth and shrinkage from 2000 to 2011. Findings suggest that declining zip codes in the 2006 to 2011 interval were more dispersed and often in new territory, in comparison with 2000 to 2006. Further, more zip codes declined from 2006 to 2011 than the preceding interval. Future research could employ multivariate statistical techniques to explore the key attributes that cause places to decline and in such a clustered fashion. Focused studies on specific cases of intra-metropolitan shrinkage could provide policymakers with guidance on how shrinkage happens on a more local scale.

Guide to further reading

Hollander, J.B. (2011) *Sunburnt Cities: The Great Recession, Depopulation and Urban Planning in the American Sunbelt.* New York: Routledge.

References

Anselin, L. (1995) "Local Indicators of Spatial Autocorrelation: LISA." *Regional Research Institute Research Chapter*, 9331, pp. 1–26.

Armborst, T., D'Oca, D., and Theodore, G. (2005) "However Unspectacular." In: Oswalt, P. (ed.) *Shrinking Cities, Vol. 2: Interventions.* Ostfildern, Germany: Hatje Cantz Verlag.

Banzhaf, E., Kindler, A., and Haase, D. (2007) "Monitoring, Mapping and Modeling Urban Decline: A Multi-Scale Approach for Leipzig, Germany." *EARSeL eProceedings*, 2, pp. 101–114.

Beauregard, R.A. (2003) *Voices of Decline: The Postwar Fate of U.S. Cities.* 2nd ed. New York: Routledge.

Bowman, A.O'M. and Pagano, M.A. (2000) *Vacant Land in Cities: An Urban Re Source.* Washington, DC: Brookings Institution Press.

Bowman, A.O'M. and Pagano, M.A. (2004) *Terra Incognita: Vacant Land and Urban Strategies.* Washington, DC: Georgetown University Press.

Boyer, M.C. (1983) *Dreaming the Rational City.* Cambridge, MA: MIT Press.

Bradbury, K.L., Downs, A., and Small, K.A. (1982) *Urban Decline and the Future of American Cities.* Washington, DC: Brookings Institution Press.

City of Youngstown (2005) *Youngstown 2010 Citywide Plan.* Youngstown, OH.

Dash, E. (2011) "Banks Amass Glut of Homes, Chilling Sales." *The New York Times*, May 23.

Fairbanks, P. (2010) "Shrinking of Cities Catches Traction." *Buffalo News*, August 3.

Glaeser, E.L. and Gyourko, J. (2005) "Urban Decline and Durable Housing." *Journal of Political Economy*, 113(2), pp. 345–375.

Goodman, P.S. (2007) "This Is the Sound of a Bubble Bursting." *The New York Times*, December 23.

Goodnough, A. (2009) "Hard Times for New England's 3-Deckers." *The New York Times*, June 20.

Hall, P. (1997) "Modeling the Post-Industrial City." *Futures*, 29(4/5), pp. 311–322.

Harding, J.P., Rosenblatt, E., and Yao, V.W. (2009) "The Contagion Effect of Foreclosed Properties." *Journal of Urban Economics*, 66, pp. 164–178.

Hillier, A.E., Culhane, D.P., Smith, T.E., and Tomlin, D.C. (2003) "Predicting Housing Abandonment with the Philadelphia Neighborhood Information System." *J Urban Affairs*, 25(1), pp. 91–105.

Hollander, J.B. (2009) *Polluted and Dangerous: America's Worst Abandoned Properties and What Can Be Done about Them.* Burlington, VT: University of Vermont Press.

Hollander, J.B. (2010) "Moving towards a Shrinking Cities Metric: Analyzing Land Use Changes Associated with Depopulation in Flint, Michigan." *Cityscape: A Journal of Policy Development and Research*, 12(1), pp. 133–151.

Hollander, J.B. (2011) *Sunburnt Cities: The Great Recession, Depopulation and Urban Planning in the American Sunbelt.* New York: Routledge.

Hollander, J.B., Pallagst, K., Schwarz, T., and Popper, F. (2009) "Planning Shrinking Cities." *Progress in Planning*, 72, p. 3 (special issue: Emerging Research Areas).

Hoyt, H. (1933) *One Hundred Years of Land Values in Chicago.* Chicago, IL: University of Chicago Press.

Hoyt, L. and Leroux, A. (2007) *Voices from Forgotten Cities: Innovative Revitalization Coalitions in America's Older Small Cities.* Cambridge, MA: MIT Press.

Hughes, A.H. and Cook-Mack, R. (1999) "The City Needs a Fresh Approach to Dealing with Vacant Property." *The Philadelphia Inquirer*, May 23.

Immergluck, D. (2011) *Foreclosed: High-Risk Lending, Deregulation, and the Undermining of America's Mortgage Market.* Ithaca, NY: Cornell University Press.

Keenan, P., Lowe, S., et al. (1999) "Housing Abandonment in Inner Cities: The Politics of Low Demand for Housing." *Housing Studies*, 14(5), pp. 703–716.

Lang, R.E. and LeFurgy, J. (2007) *Boomburbs: The Rise of America's Accidental Cities.* Washington, DC: Brookings Institution Press.

Leland, J. (2007) "Officials Say They Are Falling Behind on Mortgage Fraud Cases." *The New York Times*, December 25.

Logan, J.R. and Molotch, H.L. (1987) *Urban Fortunes: The Political Economy of Place.* Berkeley, CA: University of California Press.

Lucy, W.H. and Phillips, D.L. (2000) *Confronting Suburban Decline: Strategic Planning for Metropolitan Renewal.* Washington, DC: Island Press.

Lucy, W.H. and Phillips, D.L. (2006) *Today's Cities, Tomorrow's Suburbs.* Chicago, IL: Planners Press.

Oswalt, P. (ed.) (2006) *Shrinking Cities, vol. 2: Interventions.* Ostfildern: Hatje Cantz Verlag.

Popper, D.E. and Popper, F.J. (2002) "Small Can Be Beautiful." *Planning*, July, pp. 20–21.

Runfola, D.M. and Hankins, K. (2010) "Urban Dereliction as Environmental Injustice." *ACME: An International E-Journal for Critical Geographies*, 9(3), p. 345.

Ryznar, R. and Wagner, T. (2001) "Using Remotely Sensed Imagery to Detect Urban Change." *Journal of the American Planning Association*, 67, pp. 327–336.

Schatz, L. (2010) *What Helps or Hinders the Adoption of "Good Planning" Principles in Shrinking Cities? A Comparison of Recent Planning Exercises in Sudbury, Ontario and Youngstown, Ohio*, PhD diss. Waterloo: University of Waterloo.

Schilling, J. and Logan, J. (2008) "Greening the Rust Belt." *Journal of the American Planning Association*, 74(4), pp. 451–466.

Schumpeter, J. (1934) *The Theory of Economic Development.* Cambridge, MA: Harvard University Press.

Temkin, K. and Rohe, W.M. (1996) "Neighborhood Change and Urban Policy." *Journal of Planning Education and Research*, 15(3), pp. 159–170.

Wallace, R. (1989) "Homelessness, Contagious Destruction of Housing and Municipal Service Cuts in New York City: 1. Demographics of a Housing Deficit." *Environment and Planning A*, 21, pp. 1285–1603.

Weber, C. and Puissant, A. (2003) "Urbanization Pressure and Modeling of Urban Growth: Example of the Tunis Metropolitan Area." *Remote Sensing of Environment*, 86(3), pp. 341–352. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0034425703000774.

Wilson, D. and Margulis, H. (1994) "Spatial Aspects of Housing Abandonment in the 1990s: The Cleveland Experience." *Housing Studies*, 9(4), pp. 493–511.

Wilson, J.Q. and Kelling, G.L. (1982) "Broken Windows: The Police and Neighborhood Safety." *The Atlantic*, March.

Xiao, J., et al. (2006) "Evaluating Urban Expansion and Land Use Change in Shijiazhuang, China, by Using GIS and Remote Sensing." *Landscape and Urban Planning*, 75(1–2), pp. 69–80. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0169204605000058.

Yang, X. and Lo, C. (2002) "Using Satellite Imagery to Detect Land Use Land Cover Changes in Atlanta, Georgia Metropolitan Area." *International Journal of Remote Sensing*, 23, pp. 1775–1798.

Zinder, D.H. (2009) *Through the Rings: A Study of Housing Occupancy Declines across Major Urbanized Areas in the United States*, Unpublished Master's Thesis. Department of Urban and Environmental Planning and Policy. Medford, MA: Tufts University.