A "Simple Index" of Economic, Social and Physical Neighbourhood Change

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Abstract:

Neighbourhood change is increasingly examined by a wide range of Canadian researchers, policy-makers, and communities. When it is analyzed, however, most focus on just one dimension of change at a time or use methodology that is overly sophisticated and difficult to compute and understand. This makes many indexes inaccessible to audiences lacking statistical training. For these reasons, we explore how to create a "simple" index of change and illustrates how it can be used to understand raw absolute change in neighbourhoods versus relative change of neighbourhoods.

Abstrait

Les changements des quartiers sont de plus en plus examinés par les chercheurs, de décideurs et de communautés canadiens. Lorsqu'il est analysé, cependant, la plupart se concentrent sur une seule dimension de changement à la fois ou utilisent une méthodologie trop sophistiquée et difficile à calculer et à comprendre. Cela rend de nombreux index inaccessibles aux publics qui n'ont pas de formation statistique. Pour ces raisons, nous explorons comment créer un indice de changement «simple» et illustre comment il peut être utilisé pour comprendre les changements des quartiers.

Keywords: Neighbourhoods; socio-economic change; research methods; mid-size cities

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Policy-makers, advocacy groups, and academics are increasingly interested in processes of neighborhood level change, however, there is little consensus on what constitutes it and how to measure it. Most studies, moreover, focus on just one dimension of change – such as economic or demographic composition, and among those that look at multiple dimensions, their methodology is often complex and inaccessible to those without sophisticated training in social statistics. For these reasons, this paper examines how to create a 'simple' index of neighborhood change that accounts for multiple dimensions and which is accessible to a wide range of audiences. In creating such an index, the paper details how it can be used to examine and portray two types of change for non-specialist audiences and policy practitioners.

The paper begins by reviewing research on neighbourhood change. It examines trends and common factors measured in studies of neighborhoods in order to identify the dimensions that should be included in an index of neighbourhood change, and explores how change is analyzed. It then discusses the methods used to create an index with two potential applications. Next, the paper offers a brief overview of Halifax, the city that we apply our 'simple index' to, followed by details of its application, illustrating how it can be used. We conclude by offering insight on the strengths and weaknesses of using indexes to explore neighbourhood change.

How neighbourhood change is measured and analyzed

When researchers and policy-makers examine change at the neighbourhood level, they often focus on a single dimension, such as economic, social and cultural, or physical changes in the built environment. These are, in fact, the key elements examined in

research on neighbourhood change and are central to the concerns of most policy-makers and NGOs working on community organizing. Among studies looking at economic change, many focus on economic decline (Lee 2011; Williams, Galster, and Nandita 2013) and the conditions and trajectories of "poor" or "marginal" neighbourhoods (Cooke and Marchant 2006; Rosenthal 2008; Séguin, Apparicio, and Riva 2012). Others focus on upwardly mobile neighbourhoods and increasing patterns of segregation between the urbanizing upper versus the suburbanizing middle and working classes (Andreotti, Galès, and Fuentes 2013; Ley 1996). Some examine the economic restructuring of neighbourhoods (Walks 2001), while others analyze economic polarization (Bourne 1993a; Hulchanski 2010; Prouse et al. 2014).

Studies looking at social and cultural changes in neighbourhoods tackle a wide range of issues. Many look at gentrification (Atkinson 2004; Ley 1986; Nelson 1988), focusing particularly on the social impact of revitalization, urban renewal, and housing policies (Lee 2013; Walks and August 2008), especially for low-income residents (Vigdor, Massey, and Rivlin 2002), ethnic and racial minorities (Murdie and Texeira 2010; Boyd 2008), and senior citizens (Burns, Lavoie, and Rose 2012). Several studies examine the inclusion/exclusion of immigrants or ethnic or racial minorities at the neighbourhood-level (Murdie and Ghosh 2010), including segregation (Murdie 1994), displacement (Hyra 2015) and forced relocation (Chan, 1986). Others consider the implications of the social-demographic mix of neighbourhoods (Musterd and Anderson 2005), and changing, usually declining, social conditions (Delmelle et al. 2013).

Studies analyzing physical change often concentrate on the politics of growth and urban restructuring. They consider the effects of revitalization policies and projects on

the physical landscape of cities and neighbourhoods (Sandercock and Dovey 2002). Research has investigated the effects of housing market renewal and gentrification with an emphasis on analyzing buildings and structures and the transformation of residential and commercial spaces (Burnett 2013; Millward and Davis 1986). Studies have also examined new urban forms that are changing architectural and zoning practices (Bourne 1989; 1993b) and development patterns in a given city (Rosenthal 2008; Skaburskis 2006). It is clear that economic, social and cultural and physical aspects of change are key dimensions to account for in understanding neighbourhood change.

Even so, there is no single approach to analyzing such change (Lupton 2004). Instead, most analysis tends to follow one of two approaches. The first looks at a single neighbourhood, or a small number of neighbourhoods within a city (e.g. Hackworth and Rekers 2005; McGirr, Skaburskis, and Donegani 2014; Murdie and Teixeira 2011; Whitzman 2010). Focusing on a single neighbourhood unearths the personal and lived experiences of change, however, it does not allow for assessment of those changes compared to other areas of the city.

The second approach investigates neighbourhood change relative to other neighbourhoods in a city to identify sociospatial patterns. Such studies examine change across a city-wide context and usually rely on census or other statistical data. For example, studies analyze trajectories of poverty in neighbourhoods across the city over time (Séguin et al. 2012), others examine social conditions and quality of life (Randall and Morton 2003), while yet others look at income polarization (Hulchanski 2010; Lee and Rinner 2015; Prouse et al. 2014; Rose and Twigge-Molecey 2013; Walks 2001). Those looking at relative changes of neighbourhoods also focus on the general area of a

city in which neighbourhood(s) are located, employing categories of classification to understand broader sociospatial trends, such as “inner city” or “urban core,” and “inner” and “outer” suburbs. Research has increasingly used this approach to document the decline of inner ring suburban neighbourhoods (see Cooke and Marchant 2006; Nelson 2013; Vicino 2008). In the Canadian context, research has focused on either neighbourhoods near city centres (e.g. Townshend and Walker 2002; Walks 2001) or those located in the suburbs (Brewer and Grant 2015; Grant and Scott 2012). A less common strategy is to study neighbourhood change using large-scale data to identify sociospatial patterns in one city and then compare them to patterns in other cities (e.g. Bourne 1993a; Cooke and Marchant 2006; Ley 1988). Such studies focus on patterns relative to other cities. Interestingly, few studies compare neighbourhoods or types of areas by looking at relative differences within and across cities (Charney 2005; Davies and Murdie 1993).When relative change is examined in this way, it is often done by looking at changes in specific neighbourhoods relative to the city’s average or median change for a specific criterion, such as income. A downfall with most of these studies, however, is a tendency to focus solely on one or two dimensions of change at a time ignoring other socially relevant changes.

Multidimensional analyses that look at multiple dimensions and measures of neighbourhood change are rare. Few studies account for a mix of changes to the economic, social and cultural, and physical characteristics of a neighbourhood due to the complexity of simultaneously measuring multiple sociospatial dimensions of neighbourhood change for a large sample of neighbourhoods (Barton 2016). There is a need for scholarship that develops models that quantitatively analyze multiple indicators

of neighbourhood change over time and space, as such work will offer insight on how different dimensions are linked to one another (Lupton and Power 2004).

This is most effectively done by creating an index of change. Such indexes are designed to account for a number of different dimensions and multiple measures within a single score that can be used to gage how a given geographical context compares against others. The use of "Quality of life" and other indexes have become increasingly popular among policy-makers (Hagrety et al. 2001). Perhaps one of the most well-known indexes is the World Happiness Index (Helliwell, Layard, and Sachs 2017), which is commissioned by the United Nations and produces a "happiness score" for 154 countries based on six different variables. In research on immigrant integration scholars have also employed an index approach to assess social, cultural and civic integration, using eight variables to create a score to assess differences among sub-populations of a country (Wong and Téliz 2013). Indexes are most commonly used to examine variations among countries or among populations within countries and tend to only consider one period of time rather than change across it. Likewise, such indexes tend to rely on principle component or other forms of factor analysis to create groupings (Wong and Téliz 2013). This means that one needs sophisticated statistical training in order to understand their construction and computation. Fewer studies have applied indexes to cities, though some examples exist –such as the Canadian Index for Measuring Integration, which looks at the 33 Census Metropolitan Areas and Census Agglomerations in Canada (CIMI 2017). Of the research that looks at multiple dimensions in cities, a more common approach is to identify 'typologies', which again uses sophisticated statistical methods. Murdie, Maaranen, and Logan (2014) use such an approach to examine change of neighbourhoods

in eight Canadian cities. However, the typologies created were not mutually exclusive, which is a limitation of the methodology that resulted in much confusion when presented to groups of policy-makers, service organizations, and non-specialist academics.

For this reason, we follow the recommendations of Lupton and Power (2004), who advocate for the systematic large-scale comparison of neighbourhoods within a city, across multiple dimensions of change. We employ an index approach but create a 'simple index' that can be used to assess changes across multiple dimensions and across all neighbourhoods within a city. By 'simple,' we mean an index that does not require high levels of numeracy to calculate or interpret. We illustrate the 'simple index' with two applications that look at raw absolute changes and changes relative to other neighbourhoods in the city. Our city-wide comparative approach allows us to identify sociospatial patterns of change and offer insight on which areas are changing most and least in a city.

Creating a "simple" index of neighbourhood change

Before constructing an index to measure neighbourhood change, it is important to first define 'neighbourhood.' This is challenging because of the wide range in operationalization of 'neighbourhood' (Kitchen and Williams 2009; Nicotera 2007). Most recognize them as a social and geographic concept (Coulton, Jennings, and Chan 2013) composed of physical, symbolic and subjective boundaries (Galster 2001). Researchers have come up with many contrasting definitions (Nicotera 2007), nevertheless Census Tracts (CTs) are a common proxy among those employing quantitative research designs

(Kitchen and Williams 2009). We follow this common approach and use the terms CTs and 'neighbourhoods' interchangeably in our analysis.

To construct our index, we use Statistics Canada Census data for the city of Halifax, between 1995 and 2005. We use these data because they are accessible through "public use files," because a census was not conducted for 2010, and because 2015 data were not yet available. There were 87 CTs in Halifax in 2005 and 75 CTs in 1995. We were able to analyze change between those census years for 67 CTs using the 1995 boundaries. Eight CTs were lost due to boundary changes.

The first stage of developing the "simple index" is to select the key dimensions that will constitute it and measures that should be included. There are many ways to do this. A common approach to choosing indicators is to use factor analysis to see what measures align with common dimensions. However, this requires statistical training. Another approach is to select factors commonly used in policy or academic literature. That is, select indicators that are theoretically or policy relevant. Atkinson (2000) and Hammel and Wyly (1996) note that economic, social and cultural, and physical changes to built environment are important to consider and our literature review confirms they are consistently used in studies of neighbourhoods. For these reasons, our 'simple index' includes three dimensions (economic, social and cultural, and physical), which are accounted for by 12 variables, four for each dimension. A balanced number of measures in each dimension assures that no single dimension skews the index.

For the economic dimension, we include the percent of *lone-parent families*, the percent of *renters who spend more than 30 percent of household income on housing*, *average income* (at the individual level), and CT *unemployment rates*. We selected four

social and cultural measures, including the percent of the population *65 years or older*, the percent of the population who are *immigrants*, the percent of the population that self-identifies as a *visible minority*, and the percent of the population with *university* level education, a bachelor degree or higher, in a CT. The last dimension considers physical and tenure related measures and includes the percent of occupied private dwellings that are *apartments,* which include buildings with fewer than 5 stories as well as 5 stories or more*,* the percent that are *rented*, that are *single occupancy*, and the percent of buildings in need of *major repairs.* Percentages are calculated by simply dividing the total value of each variable by the total population that responded to the corresponding question on the Census questionnaire for a given CT, and then multiplied by 100. *Average income* and *unemployment rate* did not need to be transformed.

Once the variables were selected, we explored two ways of creating 'simple indexes.' The first application looks at **absolute raw change**. This is calculated by subtracting the value of a given measure in 1995 from its value in 2005. Recall, all measures are converted to percentages, save for average income and unemployment rate. For example, the proportion of total families in CT 113 that were *lone-parent families* was 6 percent in 1995 and 32 percent in 2005, producing a raw change value of +26. In the calculation, we use the absolute value of change, which ignores the direction of change, for a value of 26 for CT 113. We convert to absolute values because we next rank the changes for each measure and negative values would artificially imply less change than positive values. CTs are ranked by absolute change from the most to least changed, where a rank of 1 indicates the most changed. The ranking serves two functions. The first is that it creates a common standardized score across different measures. This is

important so that measures that have very high or low fluctuation do not unduly skew the index. More sophisticated methods of standardizing using z-scores or standard deviations could also be used, which are more calibrated and technical. However, our goal is to create a 'simple index' and although the ranking method is less precise it does offer a general picture of change. The second function of standardizing or ranking values is that it allows for different types of measures to be combined to create a single score which is the ultimate goal of an index. Continuing with the previous example, CT 113 experienced the largest change in the proportion of *lone-parent families* between 1995 and 2005, and so receives a ranked score of 1. In other words, we reverse rank the highest values of change to equal 1. Conversely, CT 26 experienced the least change in its proportion of single parent families, and so receives a ranked score of 67. After this calculation is performed for all 12 variables, the ranked scores for each are then summed, producing an *absolute raw change index score*. CTs are then sorted into quintiles in which the top quintile contains the 20 percent most changed neighbourhoods, ranked according to absolute change. By examining quintiles we smooth differences rankings rather than relying on individual scores. The process is summarized in the following equation:

$$Q_5\ [\textit{Absolute Raw Change Index Score} = (\sum\textit{-rank}\ |CT_{t1} - CT_{t2}|)]$$

This first application allows one to see how much a neighbourhood changes, however, it has two downfalls. First, by creating an absolute value to calculate the most and least change, the score loses the ability to identify whether a measure increases or decreases. Second, if a CT has the most change on the index score, or a specific measure, this does not mean its position vis a vis other neighbourhoods has necessarily changed. A CT may

be so far below the rest of the distribution, or above it, that even with the most change its position compared to other neighbourhoods may be negligible.

For this reason, we explore a second application of the index assessing **relative change**. In doing so we explore how neighbourhoods experience change in relation to other neighbourhoods across a city. In this application, we use the same 12 measures, but with a different calculation. We begin by ranking CTs by their value for each metric for 1995 and 2005. The highest value of a given metric is ranked 1 followed by other ranks to a maximum of 67, which is the total number of CTs in the analysis. Again, we reverse rank and the process of ranking standardizes across measures. In cases when CTs share the same proportion they share the same rank. For example, CT 10 had the highest proportion of *lone-parent families* of all CTs in 1995, so it receives a ranked score of 1. CT 113, on the other hand, had the lowest proportion of *lone-parent families* of all CTs in the same year, and there were no tied ranks, so it receives a ranked score of 67. Ranks are then summed for each year, 1995 and 2005, to create index scores for each year. To analyze the relative change for each CT, we subtract the 1995 index score from that of 2005. For example, the 1995 index score for the CT 113 is 653 and the 2005 index score is 409, for a difference between indexes of -244. Again, to gage magnitude of change we use an absolute value calculation for the same reasons as the first application of the index. Scores are then reverse ranked so that the CT with the highest score (most changed) is ranked 1. The *relative change index scores* results are then sorted into quintiles. The process is summarized in the following equation:

$$Q_5 \; [\textit{Relative Change Index Score} = (\textit{05index score} = \textit{∑-rank}\ CT_{1..12})| - (\textit{95index score} = \textit{∑-rank}\ CT_{1..12})|]$$

The scores from the two applications are analyzed by first mapping the quintiles of change across the city, to identify which CTs changed the most and least. We also explore areas of concentrated changes, for instance in the urban core compared to other areas. We then drill down to explore the top quintile of change in both applications to identify overlaps in the applications and to offer another illustration of how the scores can be used. Finally, we examine the overlaps between applications by looking at how individual measures of raw change compare to measures in the top quintile of relative change.

Halifax as a case

Research on Canadian cities tends to focus on major urban centres. Researchers have noted on several occasions that less is known about the dynamic changes occurring in secondary cities (Brewer and Grant 2015; Bunting et al. 2007; Millward 2002). For this reason, and because the authors are based there, we apply our index to Halifax, to illustrate how our index can be used to understand neighbourhood change. Although we apply the index to Halifax, the method can be tailored for other cities.

Halifax is the largest city of the Atlantic Canadian provinces and the capital of Nova Scotia. Since its founding in 1749, it has been home to the largest and most important port on Canada's East Coast. On April 1, 1996, the Town of Bedford, the cities of Dartmouth and Halifax, and Halifax County, which included smaller towns and villages, were amalgamated to form the Halifax Regional Municipality (HRM) (or simply Halifax). The creation of the HRM resulted in the city gaining notoriety of having the most spread-out urban areas in North America and created a low population density in

respect to its population with just over 414,000 in 2014 (Statistics Canada 2014), spread over 5, 500 km2 (Statistics Canada 2012).

Neighbourhoods in Halifax vary in size, geographical location, social and cultural composition, and physical attributes. The majority of the population lives either on the Halifax Peninsula, where the downtown core and inner-city neighbourhoods are located, or off-peninsula, colloquially known as the 'mainland.' The latter encompasses the former cities of Dartmouth and Bedford and stretches out to include residential communities and suburban neighbourhoods in all directions. Halifax also has rural off-peninsula communities, which include historical Acadian settlements and small fishing villages that were also amalgamated into the city.

We believe that Halifax provides a timely case study to explore the multiple dimensions of neighbourhood change and offer proof of concept for a 'simple index' that can be used in other cities.

Applying the index

Research that examines sociospatial patterns in a city often maps data across a city to identify clusterings or trends in specific areas. In the Canadian context, much attention has been placed on differences occurring in the urban core compared to inner and outer suburbs. Hulchanski (2010), for instance, shows that neighborhoods in Toronto's downtown experienced rapidly increasing incomes compared to other areas that had stagnant or decreasing incomes. His work, however, only looks at one dimension of change. For this reason, we begin our analysis by looking for patterns in CTs that fall in the top quintile of index scores for the two applications. One way of applying the index

is to compare change across regions of a city. Figure 1 examines *absolute raw change* while Figure 2 shows *relative change.*

The top quintile contains 14 out of 67 neighbourhoods in each of the two applications of the index of neighbourhood change. The darkest shade in both figures represents the most changed neighbourhoods and the lighter shades represent the neighbourhoods that have changed the least.

[INSERT FIGURES 1 & 2]

Figures 1 and 2 illustrate that change in Halifax is not limited to one concentrated area, such as the inner city or Peninsula, but rather is dispersed throughout the city. In contrast with analysis of bigger cities in Canada (e.g. Charney 2005; Ley 1986; MacLachlan and Sawada 1997; Townshend and Walker 2002; Walks 2001) these findings suggest that the most significant changes in Halifax are happening in hot spots throughout the city. As we can see in Figure 1, which plots quintiles of raw absolute change, four of the most changed CTs are located on the Peninsula, nine are Off-Peninsula, and one is in a rural part of the city. As an aside, it is worth noting that the majority of CTs as a whole are Off-Peninsula. As we explore the most changed CTs further we likewise see no clear clustering in any of the three broad geographies of the city, though we do see a pattern of excluded CTs in the Off-Peninsula and Rural areas. These are primarily excluded because of the development of sub-divisions in those areas that force boundary changes of CTs.

Although those CTs account for the most change, Figure 1 does not account for the relative position of the CT among others that are changing. As noted in the methodology section, a CT may have significant raw change, but it may not change the position of the CT in relation to others. To account for this, in Figure 2 we plot quintiles of relative

change. This time we find that of the most changed CTs, three are on the Peninsula, eight are Off-Peninsula, and three are in Rural parts of the city. Again we find no striking pattern, however, we do see a number of the CTs in the top quintile of relative change encircling the Peninsula and in the North tip of the city. These are areas that were mostly sub-divisions developed in the 1970s and 1980s. But again, hot spots best describe what is illustrated. We also see that despite important raw changes, some CTs have not changed as much relative to others on the dimension in the index.

In Table 1 we offer a different way of reporting the raw and relative changes shown in the maps. The table focuses only on the CTs that are in the top quintile of each application. The table offers more detail than the maps, by reporting the specific CTs that fall in the quintiles, the region of the city they are in, a label for the neighbourhood, as well as their change score and ranks. In both sets of top quintiles CT 113 is ranked first. Meaning, this neighbourhood experienced the most raw change while it also changed the most relative to other CTs in the 1995-2005 period. Also noted in the table, with asterisks, are CTs that are in the top quintiles of both applications of the index. We argue that these are unquestionably the most changed neighbourhoods of the city, along the dimensions and measures of the index.

[INSERT TABLE 1]

For this reason, we explore the seven 'most changed' CTs further in Table 2. In this table, we include the 12 measures of the index and report whether specific measures were in the top quintile of raw change to get a sense of what contributes to the change and led to their inclusion as most changed. We also use + or – symbols to indicate whether the measure increased or decreased its score between 1995 and 2005. We find that two of the 'most

changed' CTs are in the urban core, or the Peninsula. Both CTs fall in the city's north, the first in a rapidly gentrifying neighbourhood in the 'North End,' and the other to the west in the north part of the Peninsula. The former lands among the most changed because of a mix of factors in different directions, mainly related to the physical and built environment, including an increasing proportion of apartment buildings, increasing homeownership and improvements to the housing stock. The latter largely lands among the most changed because of social and cultural elements, change that seems to be largely driven by increasing numbers of immigrants, racialized people, and university educated, as well as changes to the physical built environment such as increased single occupancy and worsening housing conditions. It is interesting to note that the former has been the focus of much academic and community research while the latter has been largely ignored.

[INSERT TABLE 2]

When we examine the other five CTs that fall in the Off-Peninsula area we see that all but one fall in aging suburban sub-divisions, save one CT, which saw the closure of a military base and straddles a business park. As we can see among the Off-Peninsula CTs there is no dominant influence of a single dimension or set of measures behind those in the most changed CTs. Likewise, the changes are both increasing and decreasing. As a whole, Table 2 shows there is no single explanation for why a CT falls into the most changed category. Overall, the analysis offers insight into how a 'simple index' can be applied and the types of analysis that can be done.

Conclusion

The construction of a "simple" index of change allows us to systematically explore how neighbourhood change occurs simultaneously across economic, social and cultural, and physical dimensions. We examine these changes across an entire city, moving beyond a single-neighbourhood or area focus. Because the index and its two applications were created with simple addition, summation, and ranking it is a method that is accessible to those with basic numeracy skills, those without access to statistical software and, as we have shown, the index can be used for both macro sociospatial analysis using maps and detailed analysis of what drives change through basic tables. Unlike more technically sophisticated indexes, it facilitates broader presentation of results to communities and can be used as a tool for policy-makers, NGOs and those advocating for communities.

Analyzing both raw and relative change side by side provides valuable methodological insight into how social researchers could measure and conceive of neighbourhood change. For instance, there are cases in which an indicator is ranked in the top quintile for raw change, which means its respective neighbourhood experienced the most change in that measure in terms of raw values, and ranked in the top quintile for relative change, meaning it also experienced the most change relative to all neighbourhoods. However, there are cases in which a neighbourhood ranked in the top quintile for relative change on an indicator, but did not rank in the top quintile for raw change. In those cases, if that indicator was ranked in the top quintile for its position of relative change, this signifies that its position vis a vis other neighbourhoods changed significantly. This can occur despite a neighbourhood not experiencing significant change in terms of raw values of the respective indicator. Considering differences between raw

and relative change in such tables offers insights on two ways neighbourhoods experience change. That is, change in position because of lack of change, versus change that occurs because of significant differences occurring within a neighbourhood.

We suggest that neighbourhoods in the top quintile of both applications are undisputedly the neighbourhoods experiencing the most change in a city. Our 'simple index' can help non-specialists and researchers to identify changing neighbourhoods that might otherwise go unexamined and can be useful for comparative or in-depth case studies of specific neighbourhoods.

Overall, our analysis offers proof of concept on the uses and value of 'simple indexes' of neighbourhood change. The ability to measure multiple indicators and situate them within a sociospatial context is useful for urban researchers, planners, students, and policy-makers as it provides a clear and nuanced picture of the nature and trajectory of neighbourhood change. It offers a tool that is accessible to a broad non-specialist public. Because of the simplicity in calculating our index, it is our belief that the methodology we present can be useful to community organizations and advocacy groups who can easily replicate the method to suit their own objectives. A simple index provides a potential tool to empower communities seeking to better understand and manage the effects of neighbourhood change.

Figure 1: Census Tracts in Quintiles of Raw Change, 1995-2010

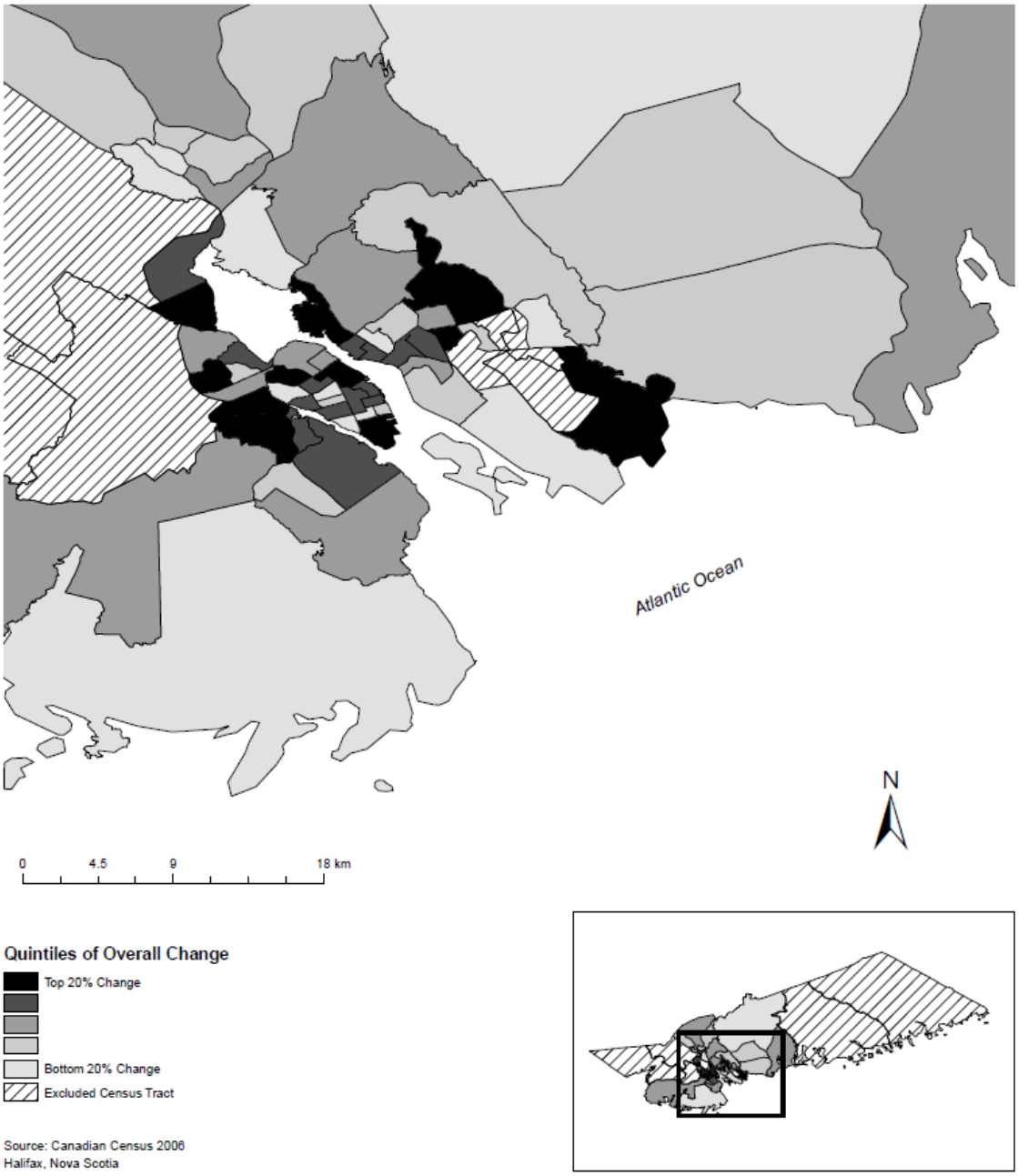

Figure 2: Census Tracts in Quintiles of Relative Change, 1995-2010

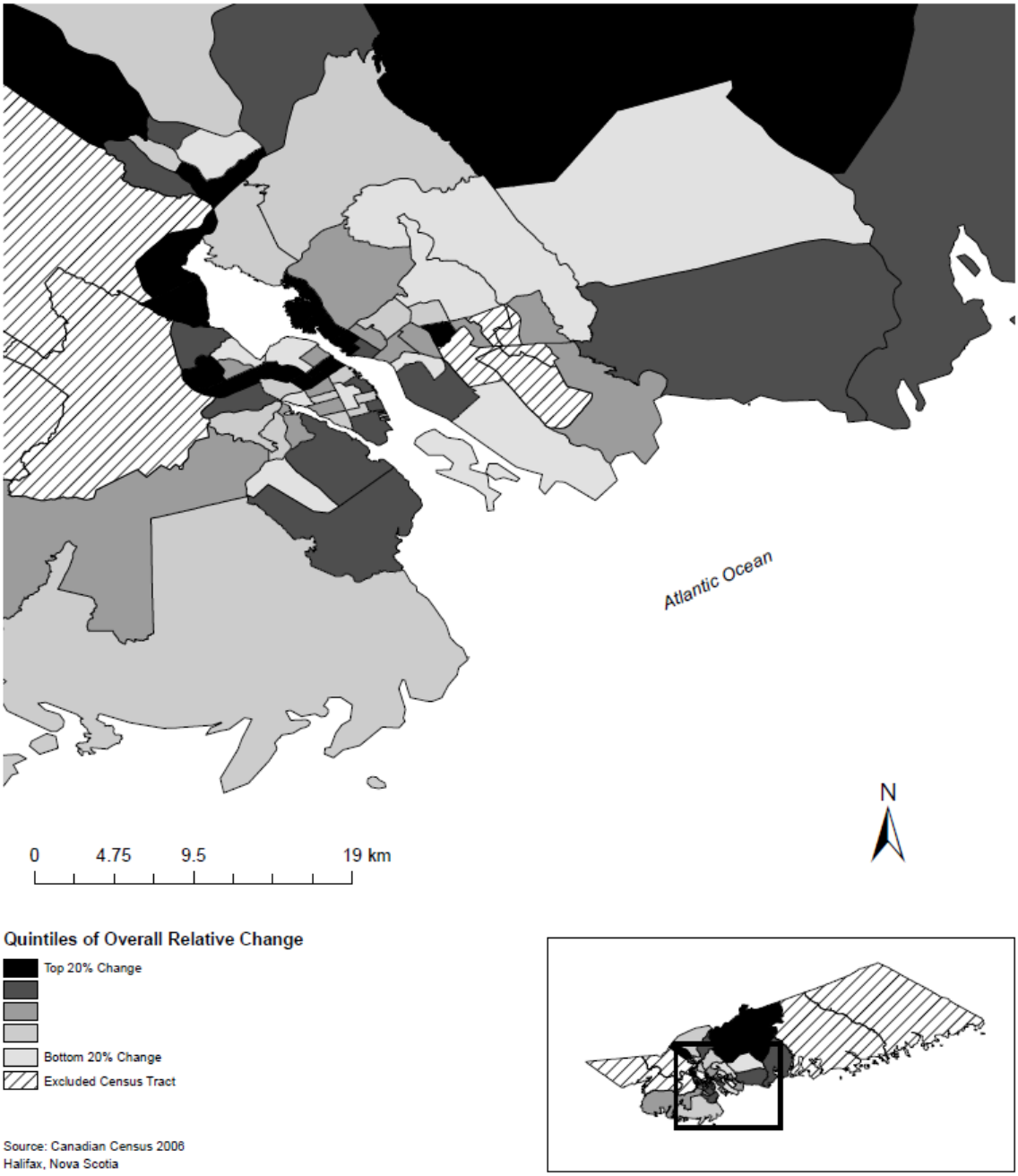

Table 1: Top Quintiles of Change Across CTs: 1995-2005

Most Absolute Raw Change

CT	Region	CT description	Raw change 05 - 95	Raw change rank	Top in both applications
113	OP	Wallace Heights	252	1	*
121.03	R	Lawrence Town	297	2	
27	OP	Hemlock Ravine	303	3	*
15	OP	Cowie Hill	317	4	
20	P	Gottingen St. North	318	5	*
23	P	West End Halifax, North	319	7	*
3	P	Point Pleasant	319	6	
16	OP	Kline Heights	331	9	*
25.03	OP	Clayton Park, West	331	8	
106	OP	Ochterloney/Dartmouth Cove	334	10	
17	OP	Chain Lakes	335	11	
104.01	OP	Woodlawn West	341	12	*
112	OP	Shannon Park	343	13	*
10	P	Agricola/Gottingen/Barrington	346	14	

Most Relative Change

CT	Region	CT description	Relative change 05 - 95	Relative change Rank	Top in both applications
113	OP	Wallace Heights	244	1	*
111	OP	Harbourview	82	2	
112	OP	Shannon Park	81	3	*
132.01	R	Beaverbank	77	4	
131.04	OP	Sackville	75	5	
152	R	Rural Northeast	72	6	
23	P	West End Halifax, North	71	7	*
20	P	Gottingen St. North	71	7	*
24	OP	Fairview West	69	9	
27	OP	Hemlock Ravine	64	10	*
25.03	OP	Clayton Park, West	62	11	*
19	P	Central Peninsula	60	12	
123.03	R	Bedford	55	13	
104.01	OP	Woodlawn West	53	14	*

Table 2: Seven Most Changed CTs by Measures of Change , 1995-2005

Variables	113 -OP		112 -OP		23 -P		20 -P	
	Top Quintile of Raw Change	**+/-**	**Top Quintile of Raw Change**	**+/-**	**Top Quintile of Raw Change**	**+/-**	**Top Quintile of Raw Change**	**+/-**
Economic								
% Lone parent	Top	+	Top	+				
30% < shelter costs	Top	+						
Avg Inc (individual)								
Unemployment Rate								
Social-Cultural								
% 65 years or older								
% Immigrants	Top	+			Top	+		
% Visible minority					Top	+	Top	-
% University					Top	+		
Other								
% Apartments	Top	+					Top	+
% Single occupancy	Top	+	Top	+	Top	+		
% Rented			Top	-			Top	-
% Major repairs	Top	+	Top	+	Top	+	Top	-

Variables	27 -OP		25.03 -OP		104.01 -OP	
	Top Quintile of Raw Change	**+/-**	**Top Quintile of Raw Change**	**+/-**	**Top Quintile of Raw Change**	**+/-**
Economic						
% Lone parent						
30% < shelter costs					Top	+
Avg Inc (individual)						
Unemployment Rate						
Social-Cultural						
% 65 years or older			Top	+	Top	+
% Immigrants	Top	+			Top	+
% Visible minority	Top	+				
% University						
Other						
% Apartments						
% Single occupancy					Top	+
% Rented	Top	-				
% Major repairs						

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