

DO FORECLOSURES DISCOURAGE HOMEOWNERSHIP?

A GLANCE AT BOSTON'S MORTGAGE LANDSCAPE AFTER THE SUBPRIME LENDING CRISIS

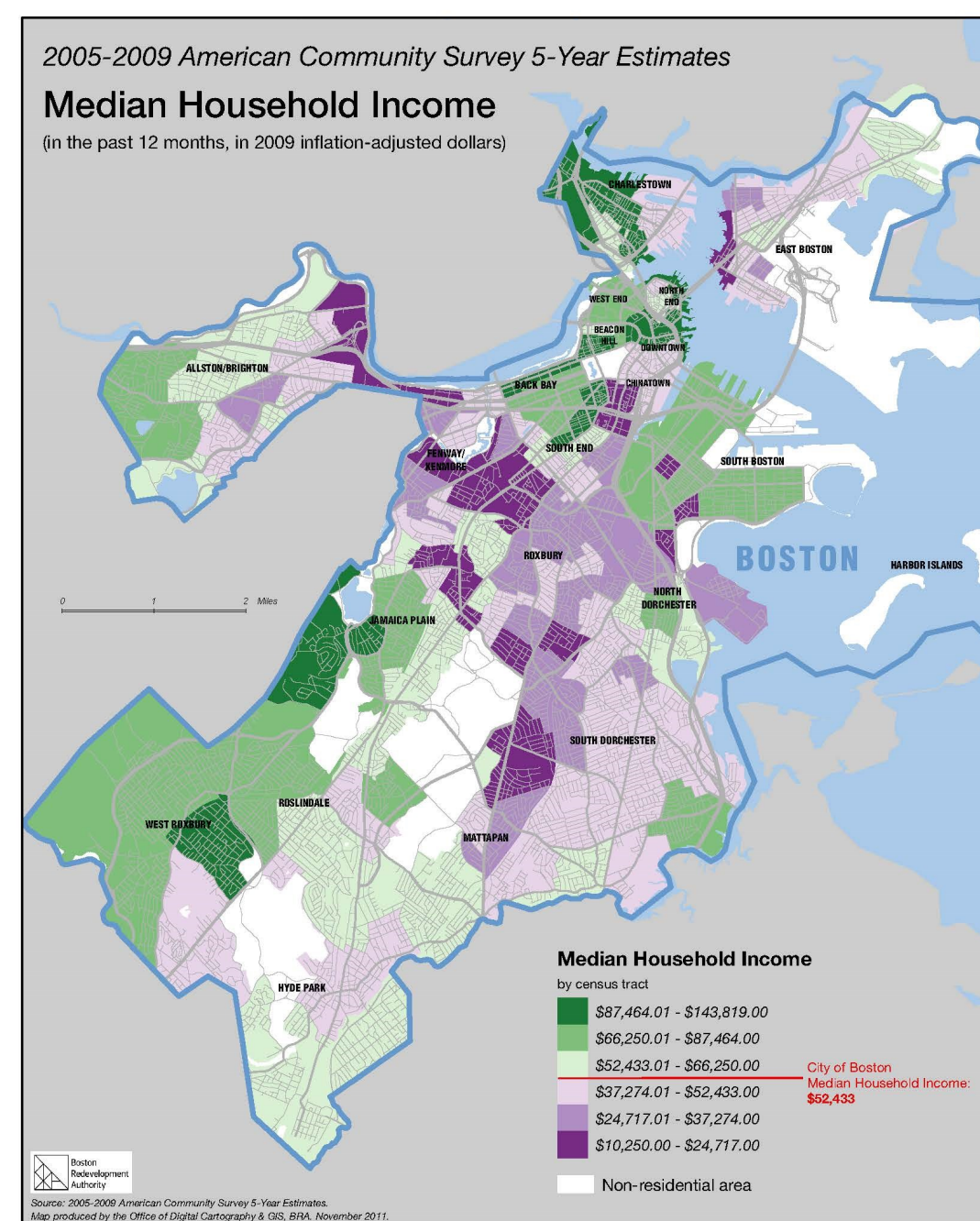


Figure 1

Overview

The financial crash of the U.S. economy in 2008 rocked the entire nation, but hit American homeowners particularly hard. In the midst of the bubble prior to the crash, American homes were appreciating at an average annual rate of 7.6% from 2000-2006, only to come crashing down by an estimated 30% in the years following the crash (Altman 2009). Experts such as Demyanyk and Van Hemert attribute this failure in the market to the growing share of subprime mortgages, which are characterized by high default risk. The share of subprime mortgages increased from 8% in 2001 to 20% in 2006. The subprime mortgage bubble eventually crashed, leading to an unprecedented increase in foreclosure rates.

Demyanyk and Van Hemert also found that default rates were higher in low- and moderate-income areas, which has led many to decry the subprime mortgage crisis as an attack on low-income households (Demyanyk and Van Hemert 2008). Boston's housing market shows some evidence of this argument. In the five years following the crash, five neighborhoods accounted for 70-80% of all foreclosure deeds across the city - Dorchester, East Boston, Hyde Park, Mattapan, and Roxbury (Department of Neighborhood Development). As shown in Figure 1, of these neighborhoods, large parts of Dorchester and Mattapan and almost the entirety of Roxbury and East Boston had average household incomes below the city of Boston median in 2009.

Using geospatial analysis, this report seeks to answer the following two questions as they pertain to the housing crisis in Boston:

- 1) Is there evidence that low income neighborhoods were disproportionately affected by foreclosures compared to other Boston neighborhoods?
- 2) Did the experience of high foreclosure rates in certain Boston neighborhoods discourage future homeownership in those neighborhoods?

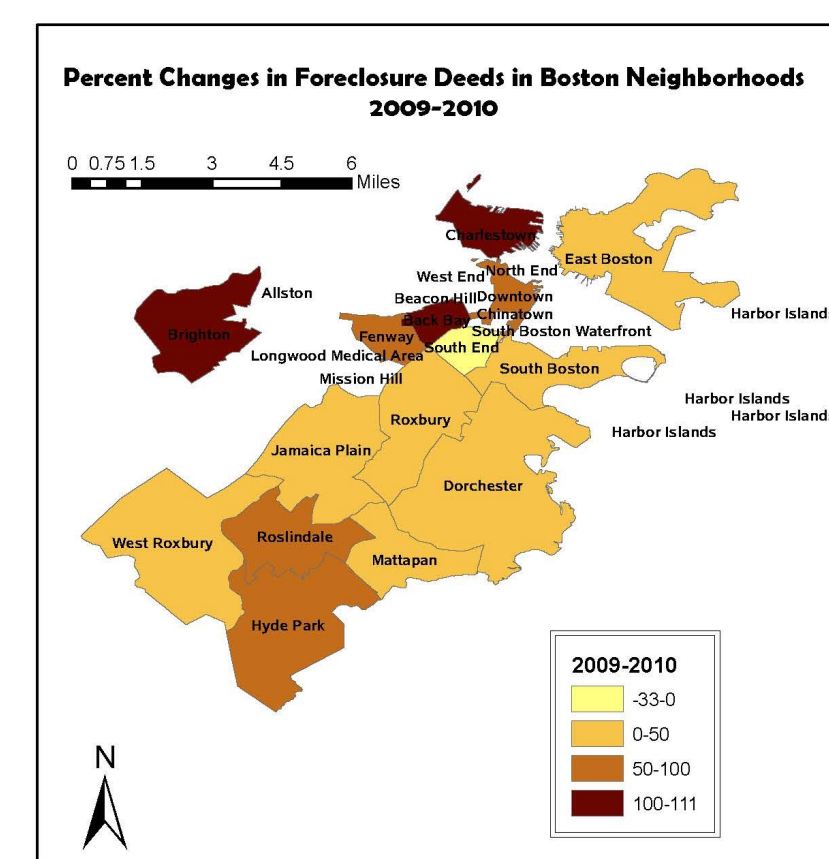


Figure 4

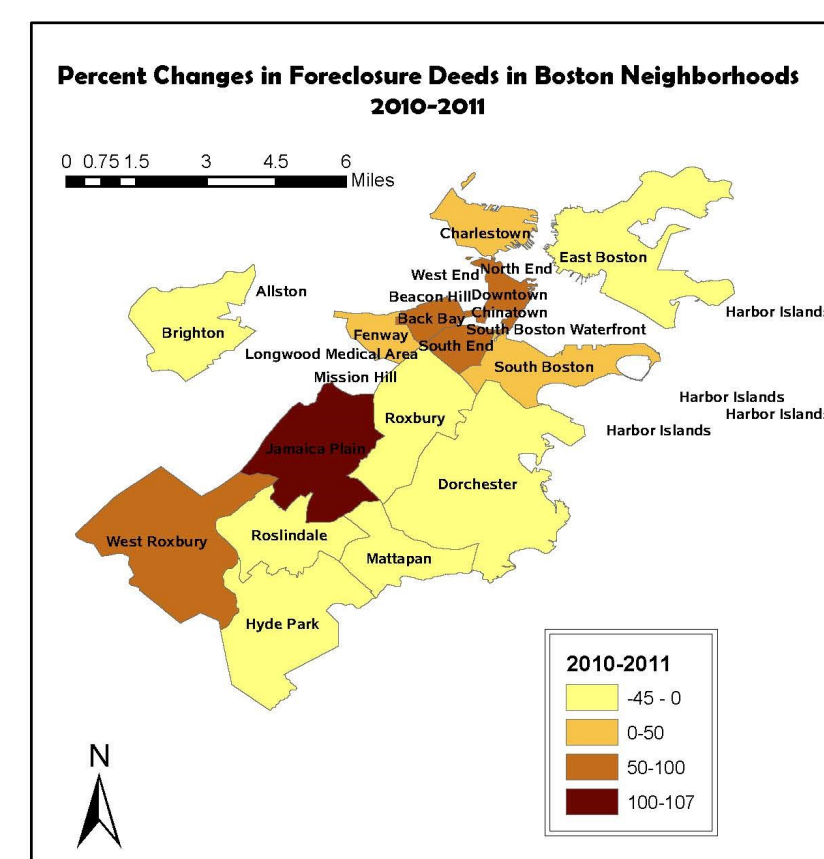


Figure 5

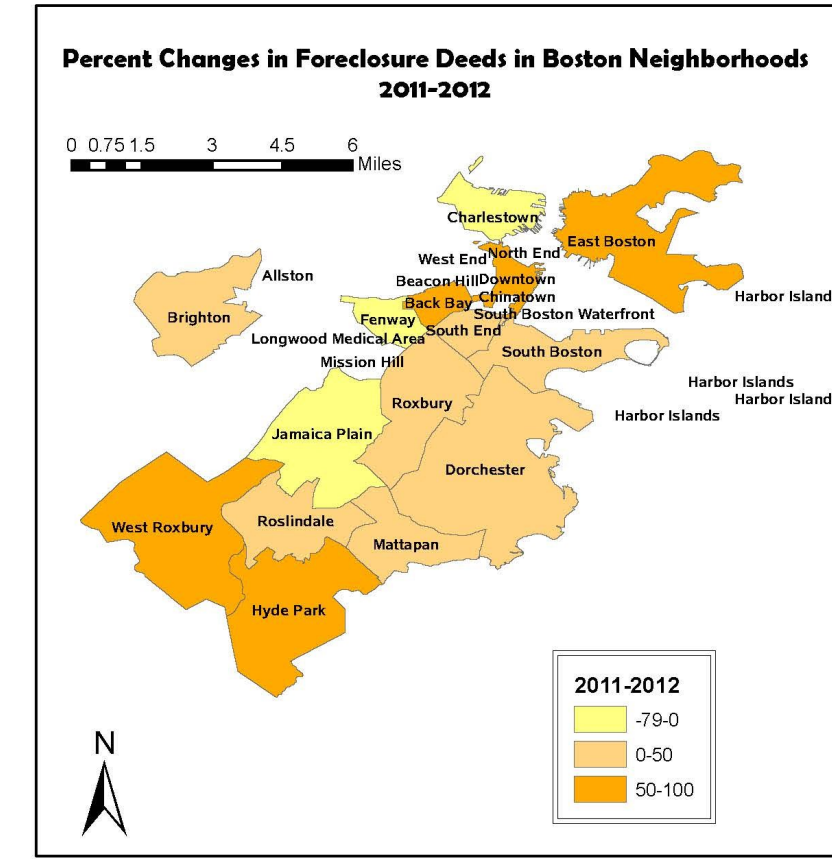


Figure 6

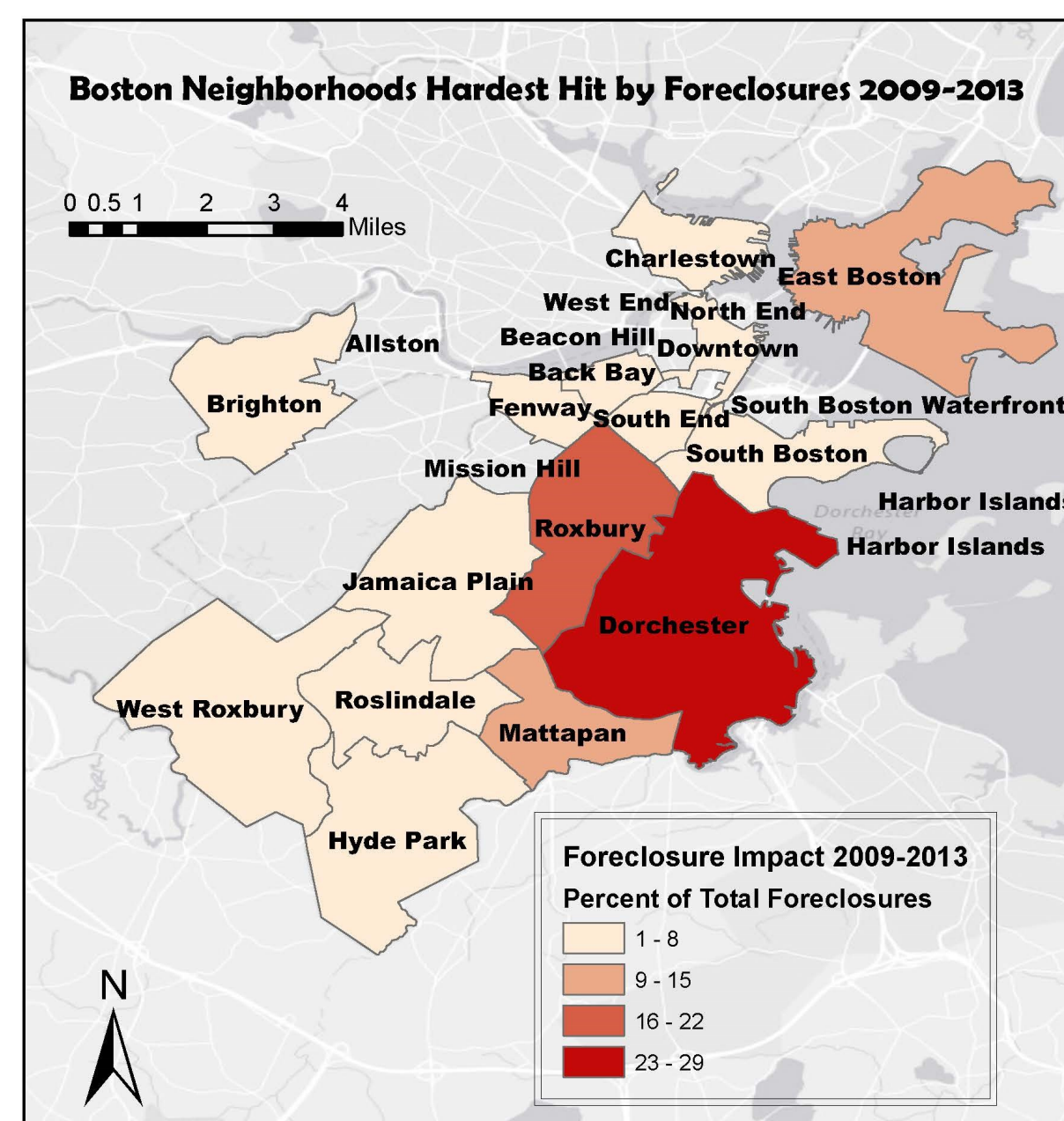
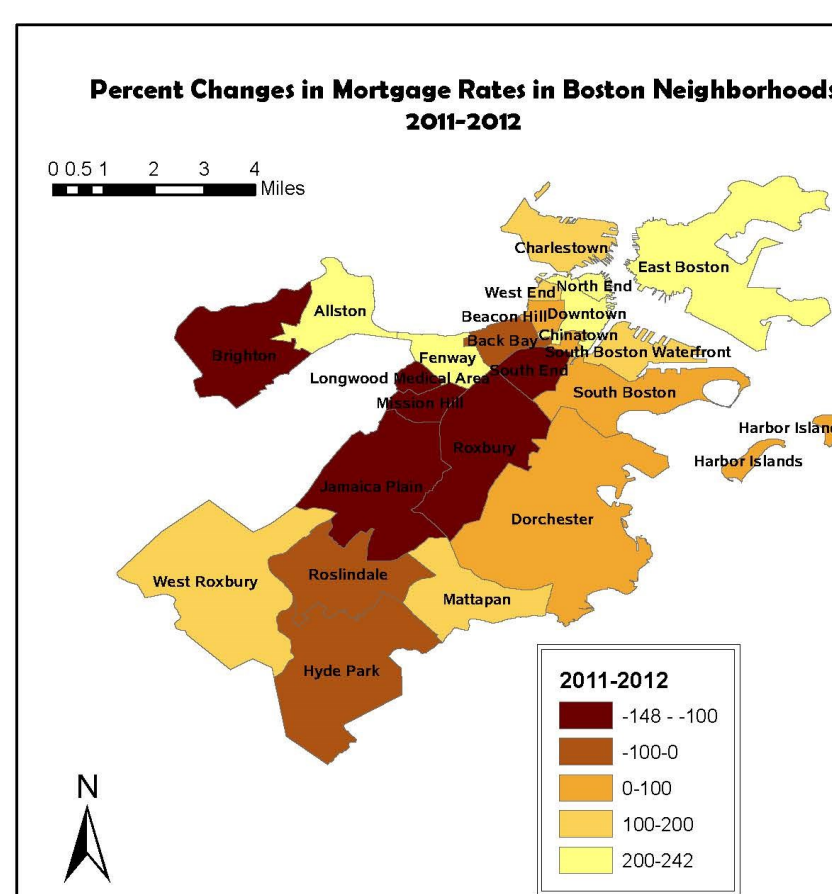
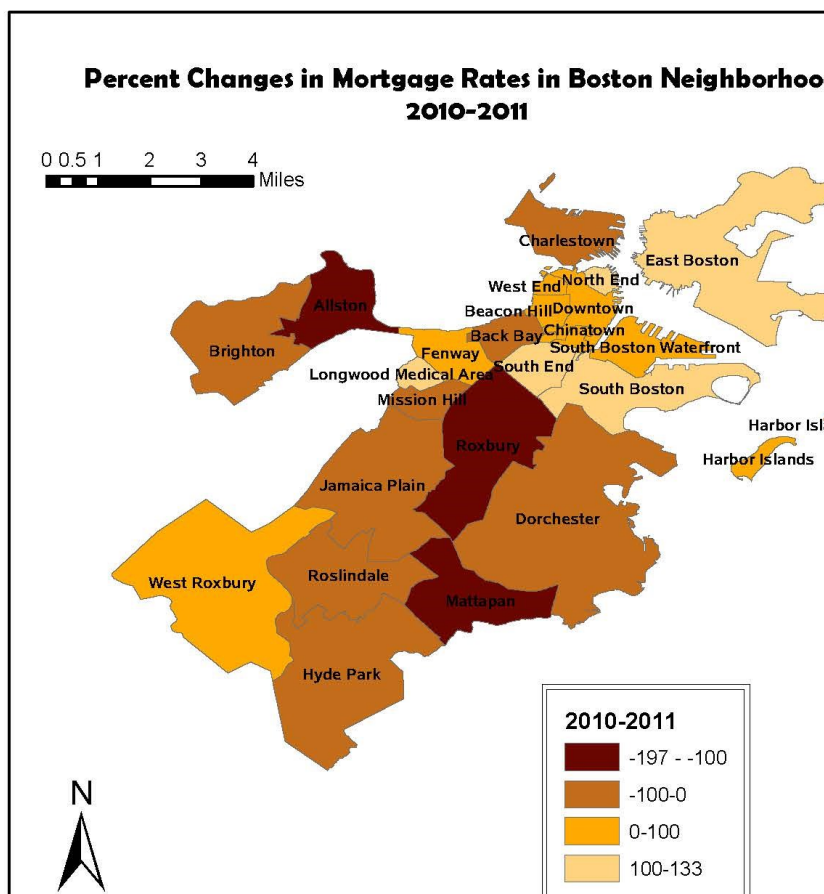
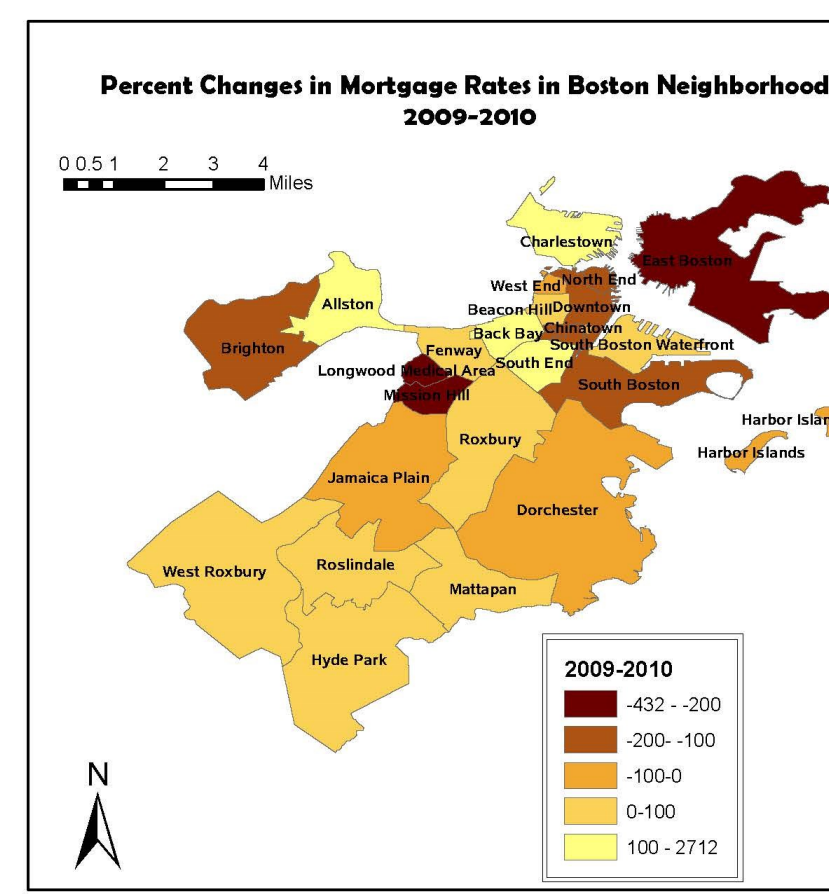


Figure 2

Methods

The two main sources of data that I collected to answer these questions were yearly data on foreclosure rates in Boston neighborhoods (from the Department of Neighborhood Development) and data on owner-occupied units with mortgages (from the American Community Survey) for 2009-2012: the four years following the housing crash. I calculated yearly percent changes in these two variables to try to capture the changing nature of the housing market as opposed to nominal values, which

are not optimal for examining the response of homeowners to a changing market. I took the yearly percent change in owner-occupied units with mortgages as an indicator of new mortgages in that year. I also calculated foreclosure percentages per neighborhood as a share of the total number of foreclosures in the five years following the housing market crash. Lastly, I used demographic data provided by the City of Boston to calculate the percent of owner-occupied units as a share of total households per neighborhood. I excluded rental households because those households do not represent the homeowners.

To answer the first question, I conducted a geospatial statistics analysis by finding the mean geographic center and one standard deviation ellipse comparing each neighborhood's share of owner-occupied households to each neighborhood's share of foreclosure rates. To evaluate the question of whether higher foreclosure rates in certain Boston neighborhoods discouraged homeownership, I observed whether the same neighborhoods that experienced high percentage changes in foreclosure deeds from one year to another also experienced low percentage changes in new mortgages that year ("same year discouragement analysis"). To determine whether there was a lagged effect, I also conducted the same process, but with mortgage change information for the following year instead of the same year ("lagged year discouragement analysis").

Results

Figures 1 and 2 show strong evidence of low-income neighborhoods being hardest hit by foreclosures. Dorchester has experienced the greatest hit in foreclosures in Boston, followed by Roxbury, Mattapan and East Boston. A significant share - if not all - households in all of these neighborhoods fell below Boston's median household income in 2009. The geospatial statistics analysis in Figure 3 further confirms this finding, showing that the mean center and 68% (1 standard deviation) of owner-occupied households are geographically distributed more northwest, while the mean center and 68% (1 standard deviation) of foreclosures are geographically distributed more southeast, which is geographically where most low-income neighborhoods lie.

The analyses find some evidence that spikes in foreclosure rates in certain neighborhoods discouraged homeownership. The "same-year discouragement analysis" for 2009-2010 found Brighton to be the only neighborhood that experienced both significant increase in foreclosures and significant decrease in new mortgages in the same year (Figure 4). However, the "lagged year discouragement analysis" saw this trend with Back Bay, Roslindale and Hyde Park. For 2010-2011, the "same-year discouragement analysis" found Jamaica Plain to be the only neigh-

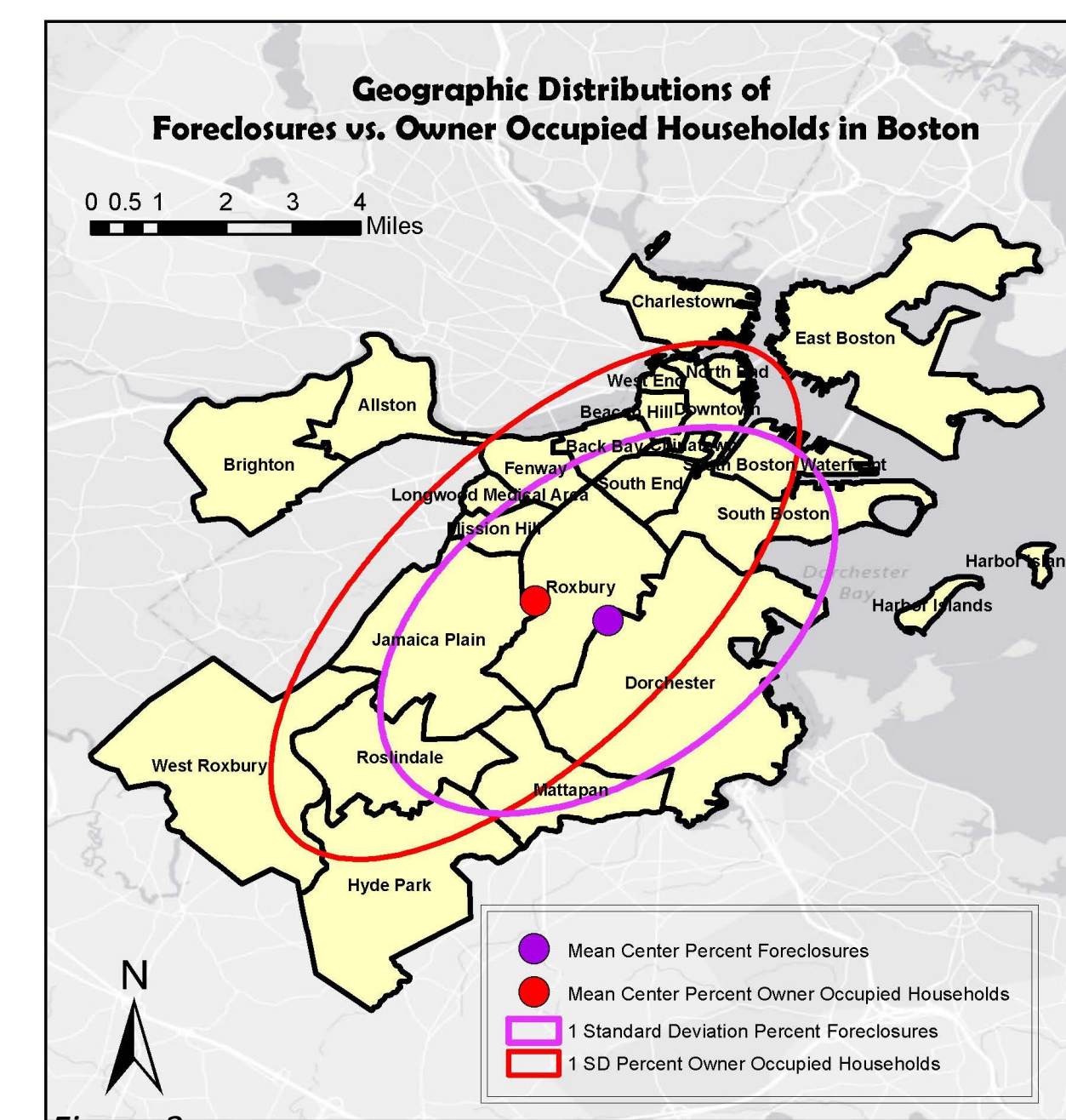


Figure 3

borhood that experienced both significant increase in foreclosures and significant decrease in new mortgages in the same year (Figure 5). However, the "lagged year discouragement analysis" saw this trend with Jamaica Plain in addition to the South End. Finally, for 2011-2012, the "same-year discouragement analysis" found Hyde Park to be the only neighborhood that experienced both significant increase in foreclosures and significant decrease in new mortgages in the same year (Figure 6).

Discussion

It is important to note the limitations that affect the results of this analysis. Firstly, using the yearly change in mortgages by owner-occupied units is an imperfect indicator of new homeowners. Additionally, this data is from the American Community Survey, which only provides estimates, not actual figures. Lastly, neighborhood level mortgage data was shown through geospatial methods that converted Census tract level data to neighborhood level and took the sum of the Census tract values, which will inevitably include some errors.

Nevertheless, the geospatial statistical analysis showed strong evidence in favor of the argument that Boston's low-income neighborhoods suffered disproportionately from the crash of the housing market and the subsequent foreclosure crisis. The "discouragement" analysis saw greater evidence of foreclosures discouraging homeownership when a one year lag was considered. The neighborhoods of Hyde Park and Jamaica Plain stood out in this analysis. Although Hyde Park was one of the five neighborhoods where Boston foreclosures were mostly concentrated following the crash, neither Hyde Park nor Jamaica Plain are significantly low-income neighborhoods, thus there is little evidence that low-income neighborhoods were more discouraged from homeownership by foreclosures, despite evidence that they experienced a disproportionate share of them.

References

- Altman, Roger C. "The Great Crash, 2008: A Geopolitical Setback for the West." *Foreign Affairs*. Vol. 88, No. 1 (January/February 2009), pp. 2-14
- Demyanyk, Yuliya and Van Hemert, Otto. "Understanding the Subprime Mortgage Crisis." *Review of Financial Studies*. Vol. 24, No. 6 (2011)

Data Sources:

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<http://www.bostonredevelopmentauthority.org/research-maps/maps-and-gis/census-and-demographic-maps>
- Census 2010
 ACS 5-Year Estimates 2009-2013
 City of Boston Data Center <https://data.cityofboston.gov/dataset/2010-Census-data-all-Boston-neighborhoods/rqmk-a7bu>
<https://data.cityofboston.gov/City-Services/Boston-Neighborhood-Shapefiles/af56-j7tb>
- Department of Neighborhood Development
<http://dnd.cityofboston.gov/#page/ForeclosureTrends>
- HUD Office of Community Planning and Development

Cartography by: Jaissa Feliz
 December 18, 2015
 Coordinate System: GCS North American 1983
 Projection: NAD 1983 State Plane Massachusetts,
 Lambert Conformal Conic
 UEP 232— Introduction to GIS