

Foreclosure Vulnerability Analysis: Boston, Massachusetts

Introduction

With the collapse of the housing market in 2008 and the subsequent recession, foreclosure rates have increased at an alarming rate. Significant research has been devoted to analyzing spatial trends in the geographic concentration of foreclosures. This analysis utilizes an imperfect model to predict areas within Boston, Massachusetts that are most vulnerable to foreclosure.

Methods

The model is based on 2000 tract level data from the Kirwan Institute and includes the four variables of homeownership, poverty rates, subway station access, and unemployment rates. Within the maps the data was weighted between values of 0-5 with zero representing areas with factors less likely to lead to foreclosure and five representing areas that contain a factor that has the highest probability of leading to foreclosure. The values from the maps representing the foreclosure variables was then combined to produce a single map that calculated all the variables values together and present a general foreclosure vulnerability map for Boston.

Results

The foreclosure vulnerability map shows several trends in the data. The model predicts higher levels of foreclosures in the Roxbury, Dorchester, East Boston, and Allston/Brighton neighborhoods of Boston. These results could be somewhat predicted given the variables used to define the model and these neighborhoods' history as being lower-income areas of the city. Conversely, neighborhoods that have historically been more affluent, such as Beacon Hill, Back Bay, and West Roxbury, show lower levels of vulnerability.

Conclusion

This project was primarily targeted at gaining experience using Arc GIS rather than constructing an accurate spatial analysis of foreclosure vulnerability. While each of the variables have been cited as factors in determining neighborhood vulnerability, significantly more variables would be required to expect sufficient accuracy in the model's predictions. For example, it would be important to account for high concentrations of student populations in order to more accurately understand the distribution of unemployment and homeownership. This would be particularly important for understanding the Allston/Brighton and Fenway neighborhoods. Also, transportation would be better addressed in the model if we included commuter rail stations and bus stops in addition to subway stops when measuring job access and its relationship to neighborhood stability.

Homeownership

High levels of homeownership have often been cited as being related to neighborhood stability. Therefore, this model assumed that areas with lower homeownership levels were less stable and therefore could expect higher levels of foreclosure.

Poverty Rates

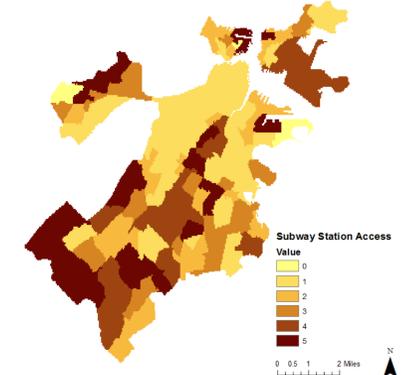
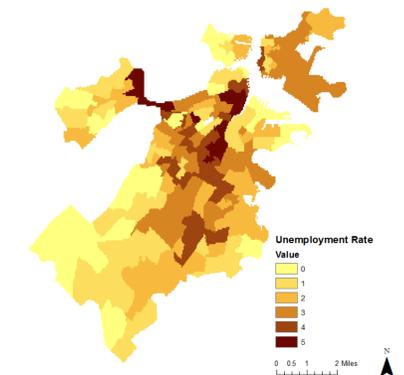
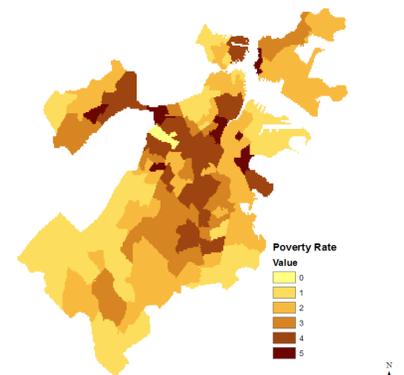
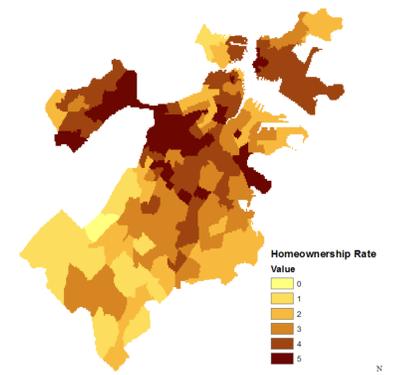
Poverty rates are often associated with foreclosure rates for several reasons. Those households who earn less income are more susceptible to unexpected increases in costs that are commonly associated with homeownership. As such, they are more likely to face foreclosure when these costs arise. Also, there have been studies that show higher trends of predatory and sub-prime loans amongst mortgagees who earn less money. Since these types of loans are more risky for homeowners they are often have a higher rate of foreclosure.

Unemployment Rates

The recent recession has led to countless layoffs across the nation. Those who have lost their jobs are also likely to have difficulty paying their debts including mortgages. Therefore, this model examined unemployment rates to determine which areas would be more likely to contain homeowners who might be having difficulty keeping up with their housing payments.

Subway Station Access

Access to jobs is another measure of foreclosure vulnerability. For this model we calculated the percentage of a tract that lies within a half mile of a subway station. Since the subway stations in Boston lead to most of the main employment centers for the region a case can be made that these homes would be less likely to face foreclosure as they would have better access to jobs and retain relatively more of their value despite recent market trends.



Sources: Kirwan Institute, Ohio State; Boston Redevelopment Authority; MassGIS
Projected Coordinate System: GCS North America 1983

