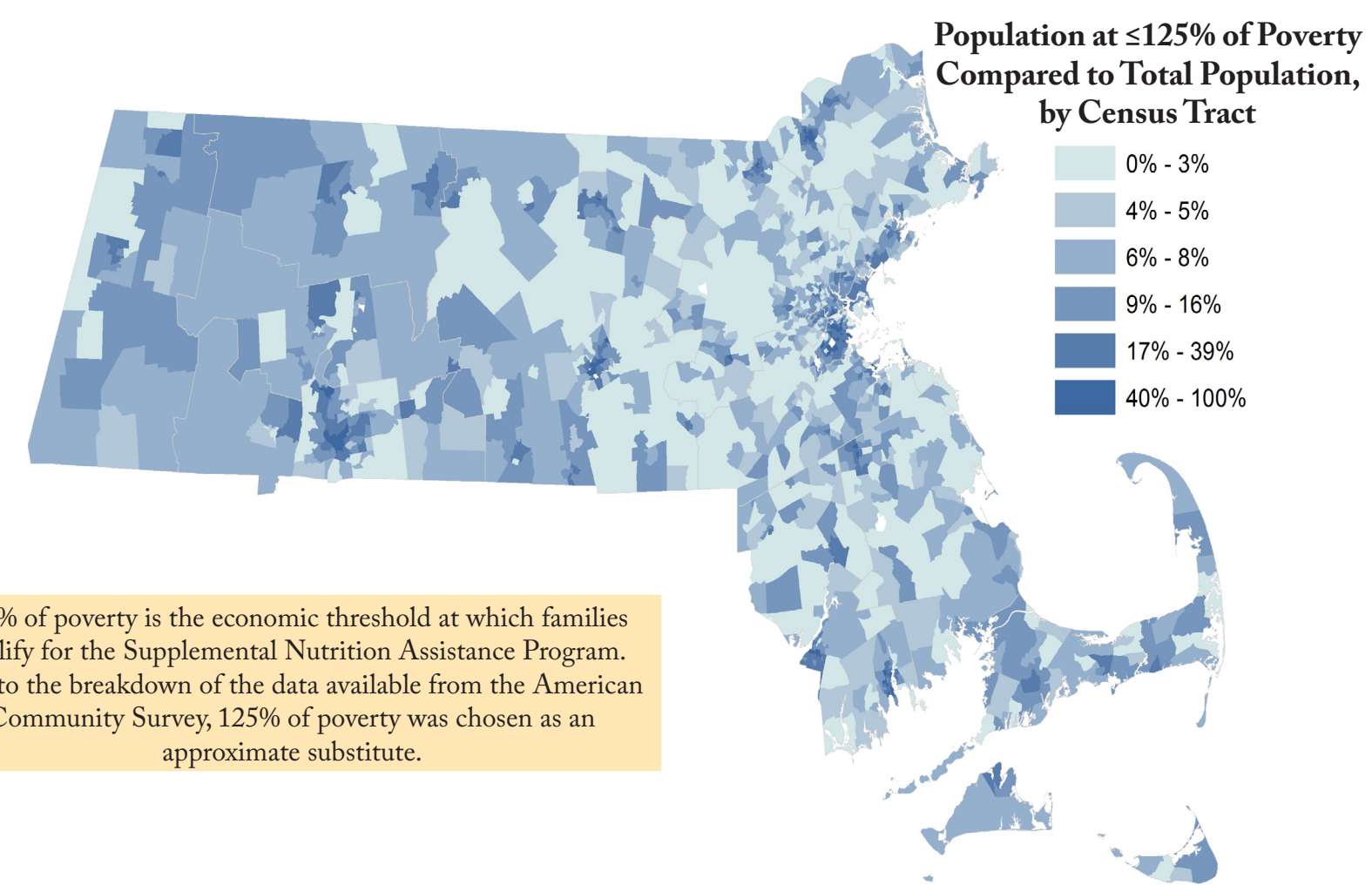


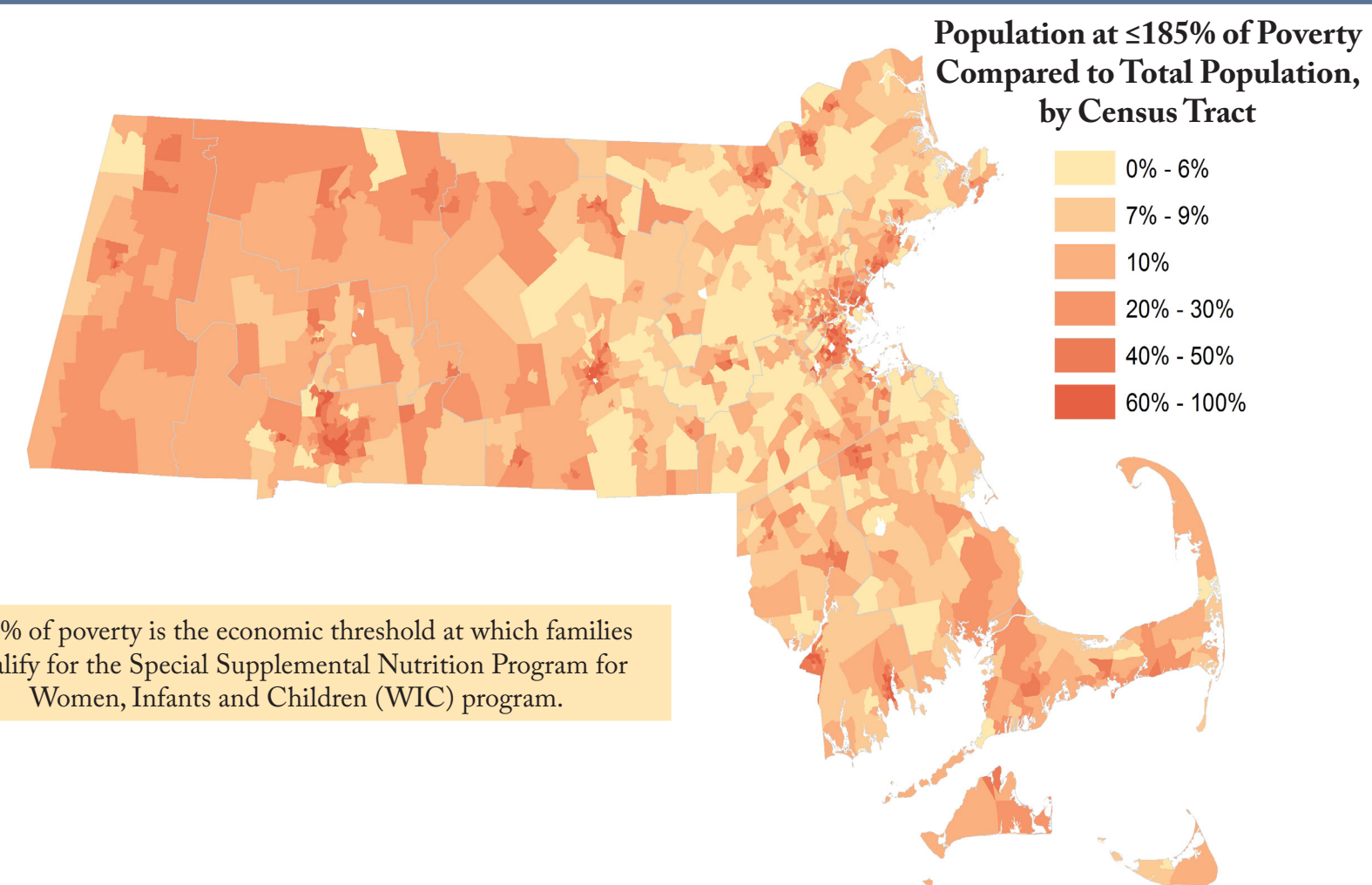
ACCESS TO FOOD SAFETY NET IN MASSACHUSETTS

RISK FACTORS



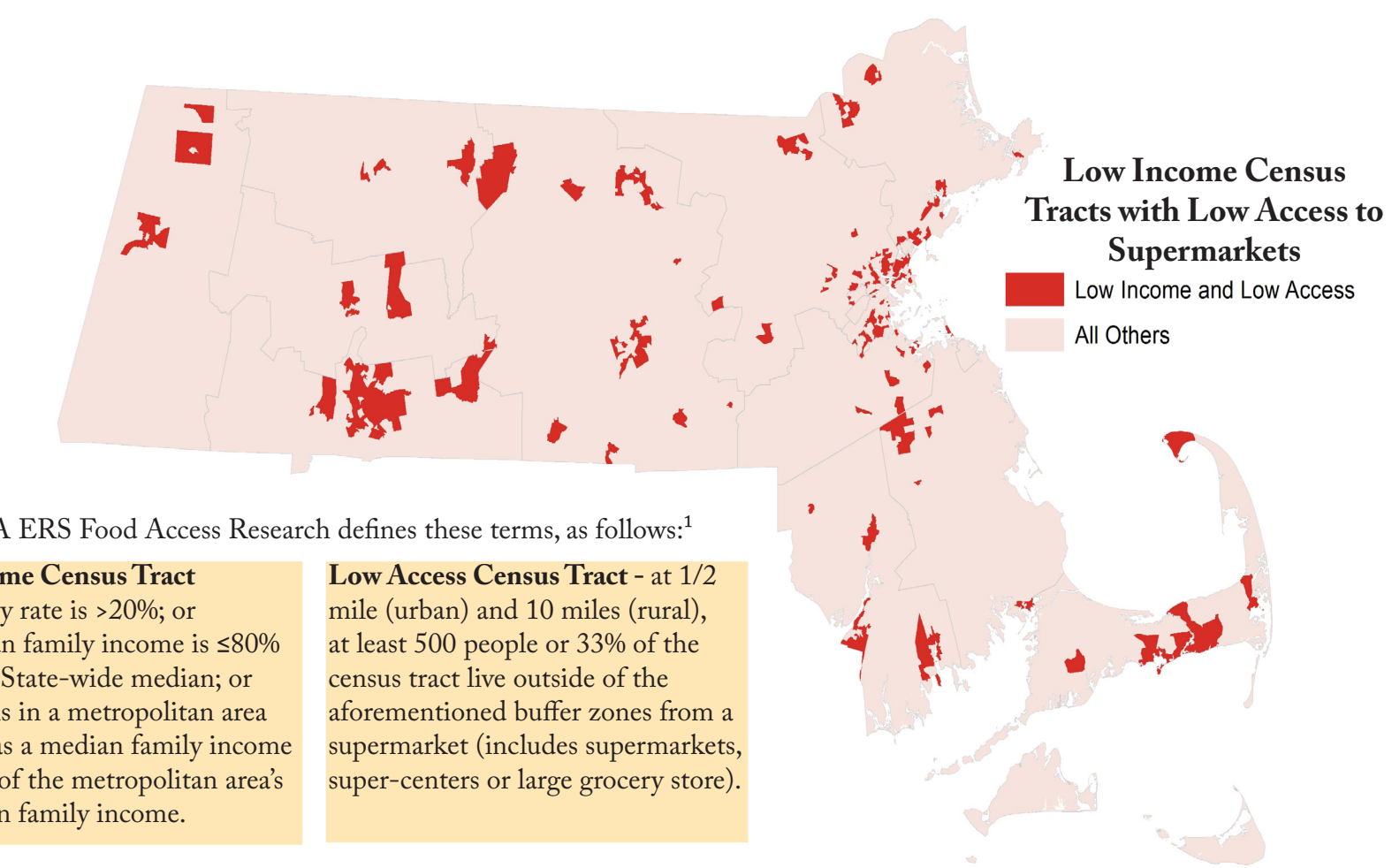
130% of poverty is the economic threshold at which families qualify for the Supplemental Nutrition Assistance Program. Due to the breakdown of the data available from the American Community Survey, 125% of poverty was chosen as an approximate substitute.

125% of Poverty and Below



185% of poverty is the economic threshold at which families qualify for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) program.

185% of Poverty and Below



The USDA ERS Food Access Research defines these terms, as follows:¹

Low Income Census Tract

- Poverty rate is >20%; or
- Median family income is ≤80% of the State-wide median; or
- Tract is in a metropolitan area and has a median family income ≤80% of the metropolitan area's median family income.

Low Access Census Tract - at 1/2 mile (urban) and 10 miles (rural), at least 500 people or 33% of the census tract live outside of the aforementioned buffer zones from a supermarket (includes supermarkets, super-centers or large grocery store).

Low Income & Low Access

BACKGROUND

Food insecurity is the inability, at some point during the year, to provide adequate food for one or more household members due to lack of resources.² Since the beginning of the economic recession in 2008, the rate of food insecurity in Massachusetts has grown by over 43%. Based on data from 2011, the state residents reached 11.9% food insecurity, which is the highest rate recorded since the census began collecting this information in 1995.³

While the lack of resources that contribute to food insecurity can be purely financial, they can also be a more complex network of factors that create disparities and barriers to accessing food, especially healthy food. Food deserts are considered to be areas void of at least one supermarket and are often the focus of food access research. In a meta-analysis by Walker et al (2009), a review of food desert literature was conducted to tease out the common factors contributing to food insecurity and food access in the United States.⁴ Access to stores, income/socioeconomic status, food store density, and store location were four of the 11 main findings of the literature review. As elements that are suitable for geospatial analysis, they were chosen to be examined as a part of this project.

To take the analysis a step further, this project sought to acknowledge that many food insecure individuals and families use public benefits for purchasing supplemental meals. Safety-net programs like the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) program and the Supplemental Nutrition Assistance Program (SNAP) (formerly known as Food Stamps) work to ensure that individuals and families have access to sufficient and nutritious food. The monetary benefits of these programs can be used in many food retailers and supermarkets, and food desert research must look to understand specifically where stores are located that accept WIC and SNAP.

While SNAP and WIC are meant to be temporary programs that serve families over a relatively short span of time to help them reach a place of greater stability, food pantries and meal programs are historically seen as part of the emergency food system that families can fall back on as a last resort to avoid going hungry. Due to residual effects of the economic recession, these emergency food supports are unfortunately used for longer terms than their original intention, and they are becoming a more essential piece within the food system. Understanding how food pantries and meal programs are situated throughout the state is also key to getting a sense of the ease at which low income individuals and families can access these supports.

For the purpose of this analysis, the distribution of the retailers and emergency food programs in Massachusetts was the focus, with the intention of visualizing where gaps in the safety net might exist. Comparing this to the distribution of low income individuals throughout the state and the specific areas of low income/low access to supermarkets (as indicated by the Food Access Research Service at the U.S. Department of Agriculture), the maps included here offer a visualization of where there may be unmet food security needs in Massachusetts.

METHODS

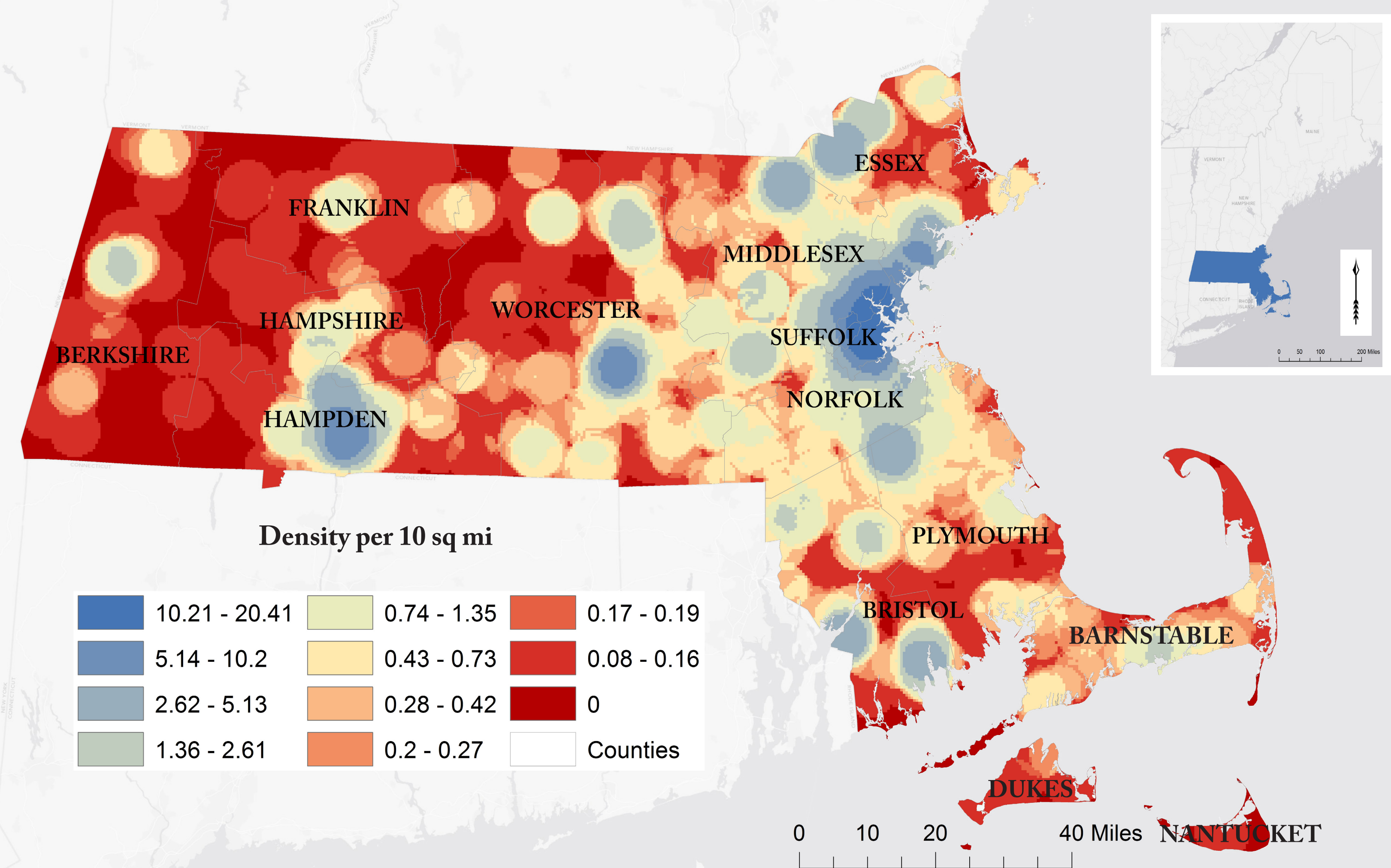
To analyze Massachusetts residents' access to food-related safety net programs, address data was collected for retailers accepting WIC, retailers accepting SNAP, food pantries, and meal programs. Each address was geo-coded using the 2010 Census TIGER Roads shape file. While the data sets for retailers had zip codes available, the food pantries and meal programs did not include zip codes for the 700+ locations. A work-around was used plotting the points on Google map, exporting to Google Earth as a KML file, then converting it into a layer in ArcMap. Because this method only allowed for maps to be processed with 100 points at a time, the data for meal programs and food pantries had to be merged in ArcMap once each section was completed using the work-around.

After the point data was plotted in ArcMap, raster analyses were performed to create a density raster for each location type. The density rasters were chosen because they would be able to illustrate the distribution of each food access point throughout the state. For all four maps, cell size was set at 1000 and search radius at 10 square miles, in order to illustrate adequate detail, maintain smoothness within the rasters, and allow for appropriate snapping during the overlay analysis. Using the raster calculator, an overlay analysis was done to combine the density rasters from each location into the final map. As a result, it is easily seen where there are gaps in the food safety net in Massachusetts, based on areas of the state that have little to no meal programs, food pantries, SNAP and/or WIC retailers.

To offer supplemental information about income distribution in Massachusetts and areas that are at a particularly high risk for food insecurity, three additional maps were created. Poverty thresholds are set at the federal level as measures of income that indicate poverty status. These thresholds are then used to report poverty rates throughout the United States and are guidelines for determining income eligibility for public assistance programs. For this analysis, data from the 2011 American Community Survey was used, showing the number of individuals at portions of the poverty threshold (i.e. 0.5/50%, 0.75/75%, etc.), and calculations were done to create a total for individuals at 125% of poverty and below and 185% of poverty and below. In Massachusetts, 185% of poverty is the income qualification for WIC and 125% of poverty is serving as a proxy for the SNAP qualification, two of the categories chosen for the raster analyses. Due to the breakdown of the data available, the actual guideline of 130% of poverty was not available, and it was decided that 125% would be the most accurate substitute. This data was imported into ArcMap, joined to the Census tract shape file and formatted into choropleth maps.

The third supplemental map was derived from the USDA ERS Food Access Research Atlas, which analyzes areas with high proportions of low income individuals who have low access to supermarkets (see detailed definition in the map box to the left). This data was imported into ArcMap, joined to the Census tract shape file and formatted into a choropleth map.

TOTAL DISTRIBUTION OF FOOD SAFETY NET PROGRAMS



CONCLUSION

Based on the analyses of food safety net program distribution through the state compared to the areas of low income and high need by census tract, there seem to be the largest deficits in western and central Massachusetts. The strongest concentrations of food safety net access points appear to be in areas more densely populated with low income residents, which would imply that many low income residents have adequate access to the food safety net in Massachusetts. Not shown specifically in any maps in this analysis, the concentration of programs also appears to be focused more in urban areas.

These maps do not serve as a formal conclusion that an increase in food safety net access points is needed in the western and central Massachusetts, but they do raise questions for further analysis. Layering the final overlay analysis with either the 125% or 185% of poverty map would give a more specific view of where lower income populations live in reference to the gaps in the food system. Additionally, it would be important to understand the total population distribution and presence of rural versus urban areas, to get a sense of how many people live in proximity to the current access points. Finally, transportation options, ease of access, and transport time are other factors that should be included in future analyses, as those are also factors that limit access to healthy, affordable food.

Cartographer: Megan Lehner, Fundamentals of GIS, December 13, 2013

Projections: NAD 1983 StatePlane Massachusetts FIPS 2001 (US Feet); GCS North American 1983

Data Sources: American Community Survey 2011, 5 Year Estimates; Food Access Research Atlas, Economic Research Service, USDA; Health and Human Services, Mass.gov; SNAP Retail Locator, Food and Nutrition Service, USDA; Project Bread, MassGIS; ESRI 2013, DeLorme, NAVTEQ

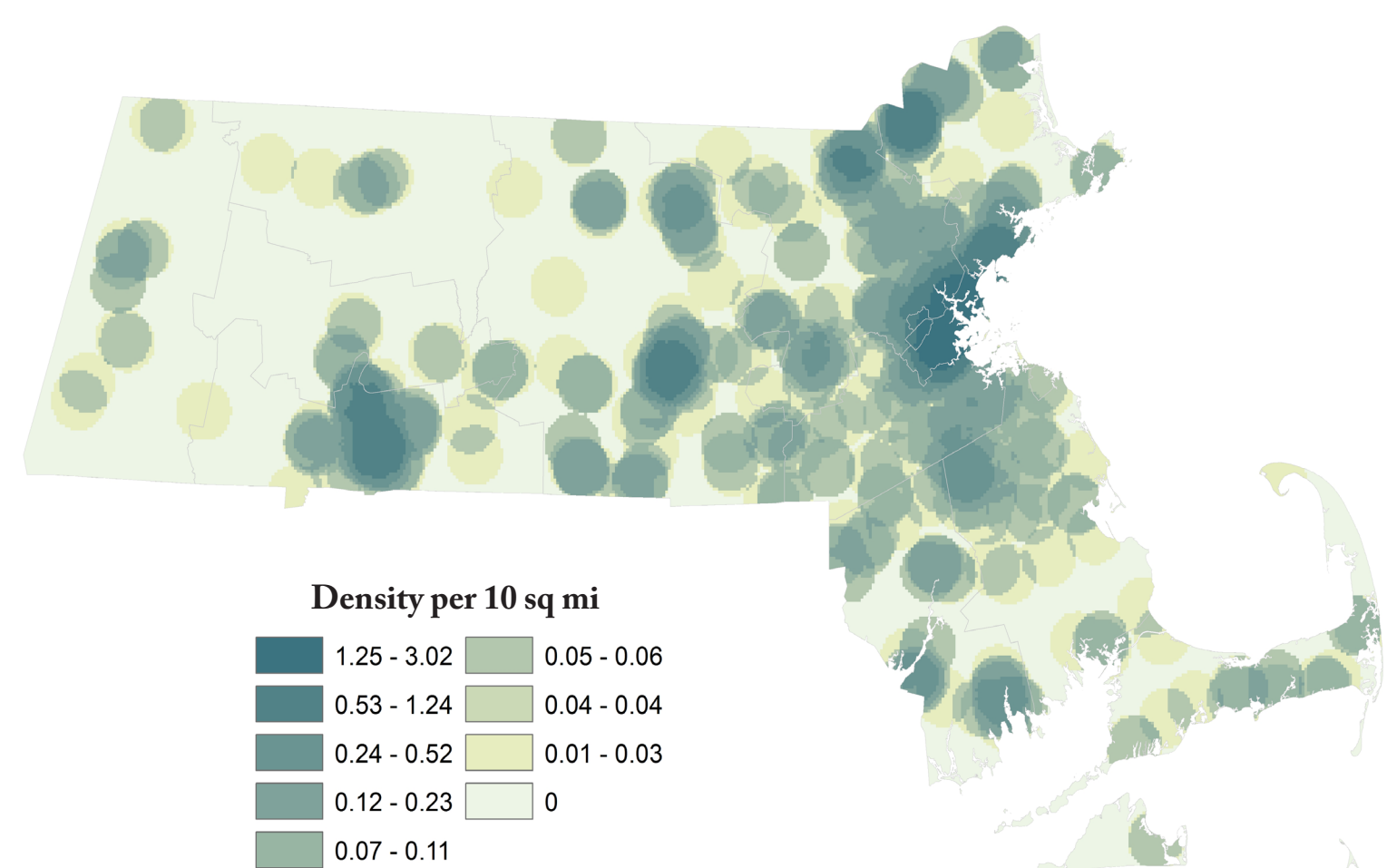
Citations: 1 "FARA Documentation". Economic Research Service (ERS), U.S. Department of Agriculture (USDA). Food Access Research Atlas. 2013. <<http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx#definitions>>.

2 "Definitions of Food Security". Economic Research Service (ERS), U.S. Department of Agriculture (USDA). 2013. <<http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx#UqiPI-JV9Lc>>.

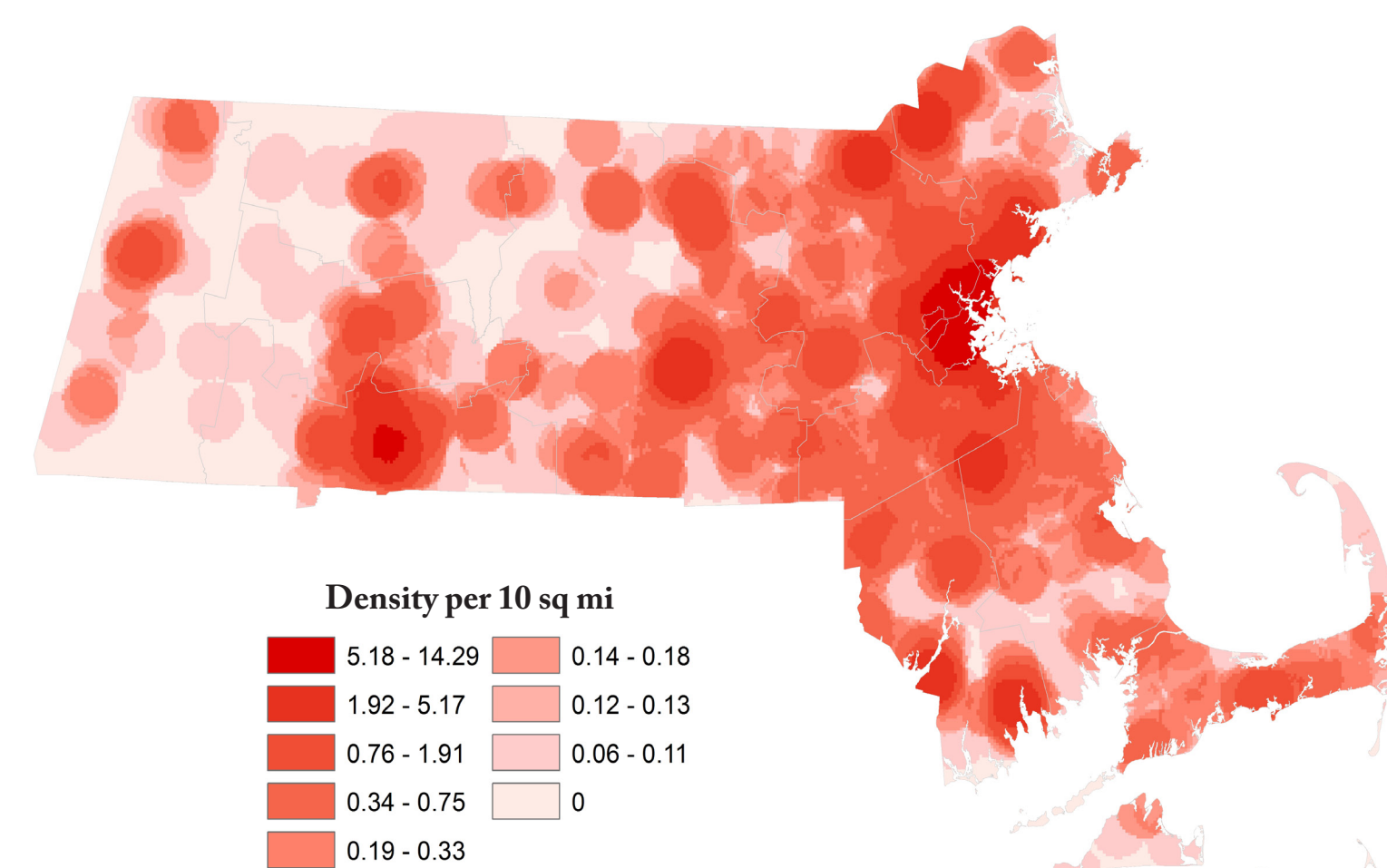
3 Project Bread. "Status Report on Hunger in Massachusetts". 2012. <http://www.projectbread.org/site/DocServer/12_100A_StatusReport_WebVersion_pdf.pdf?docID=7521>.

4 Renee E. Walker, Christopher R. Keane, Jessica G. Burke. "Disparities and access to healthy food in the United States: A review of food deserts literature". Health & Place. Volume 16, Issue 5. September 2010. Pages 876-884. <<http://www.sciencedirect.com/science/article/pii/S1353829210000584>>.

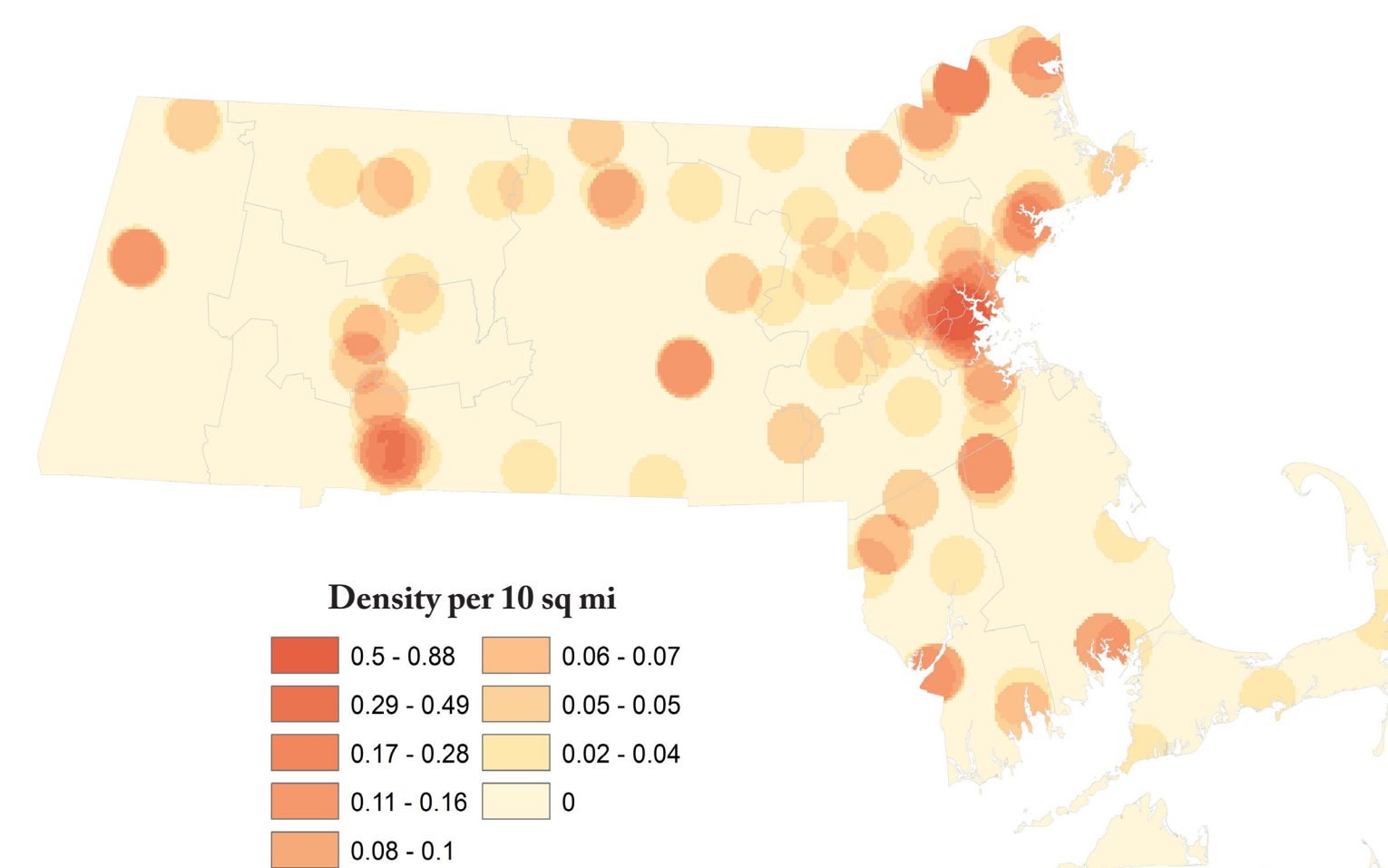
FOOD SAFETY NET PROGRAMS



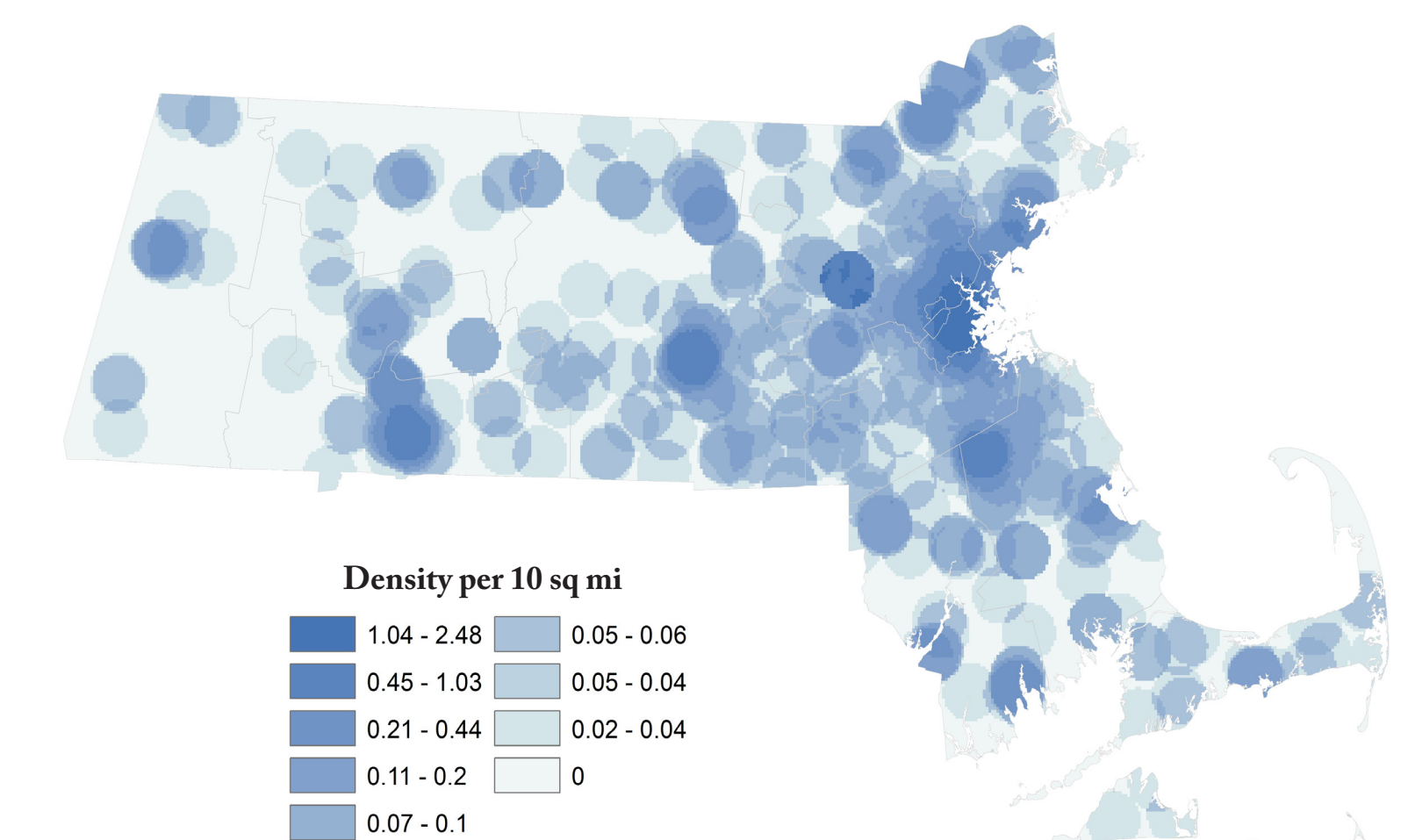
WIC Retailers



SNAP Retailers



Meal Programs



Food Pantries

