

Obesity and Food Access in the Greater Seattle Area | King County, Washington

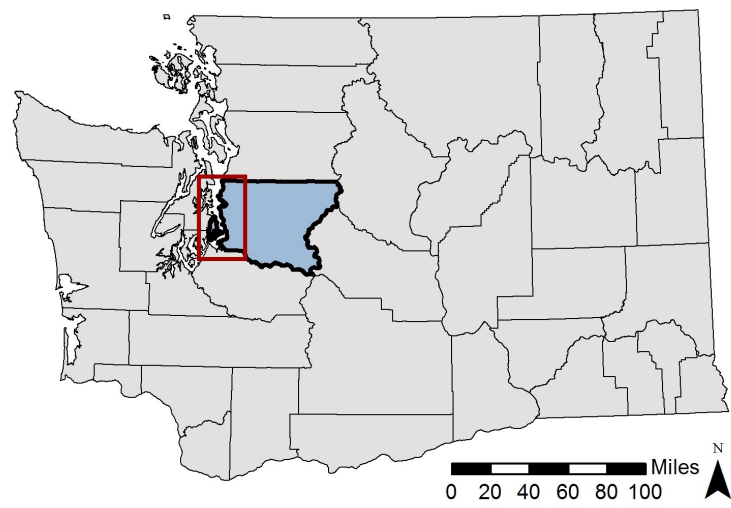
INTRODUCTION

Medical costs associated with obesity in the United States were estimated at \$190 billion in 2012, accounting for 20.6% of healthcare expenditures in the United States. This translates to medical bills for obese people that can be over \$3,000 more per year than people of a normal weight. This is a huge individual and national burden. The CDC lists specific races/ethnicities and income levels that are at a higher risk for obesity. But in 2001, a study done by the University of Washington mapped obesity by zip code in King County, Washington and found that zip codes and property values are better predictors of obesity than income or race/ethnicity. This project looks more closely at geographic determinants of health.

One way to evaluate geographic risk for obesity is to locate food deserts. These are areas defined as places where 20% of the population lives below the poverty line and 33% of the population lives more than a mile from a

grocery store. This extreme inaccessibility isn't typically seen in cities, but I wanted to look at Seattle from a similar perspective. In 2012, the Department of Natural Resources and Parks and GIS Center for King County, the county where Seattle is located, conducted a project to find which areas in King County can easily access grocery stores by taking the bus or walking. This project overlaid the access area maps with income and race demographics. This project focuses on the health outcomes of these patterns. If populations have easier access to grocery stores selling fruits and vegetables, do they have lower obesity rates?

Location of King County and the Greater Seattle Area

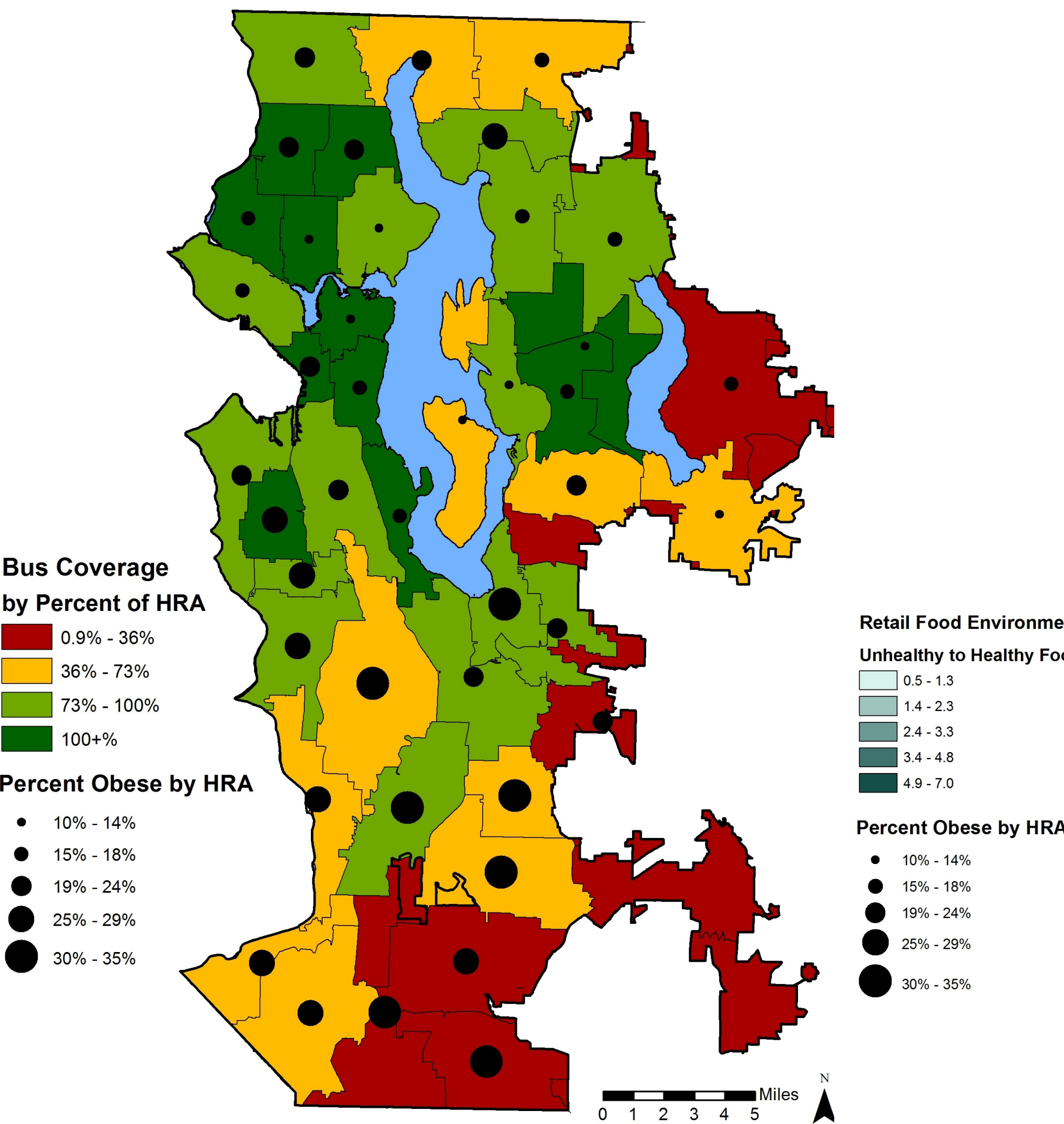


METHODS

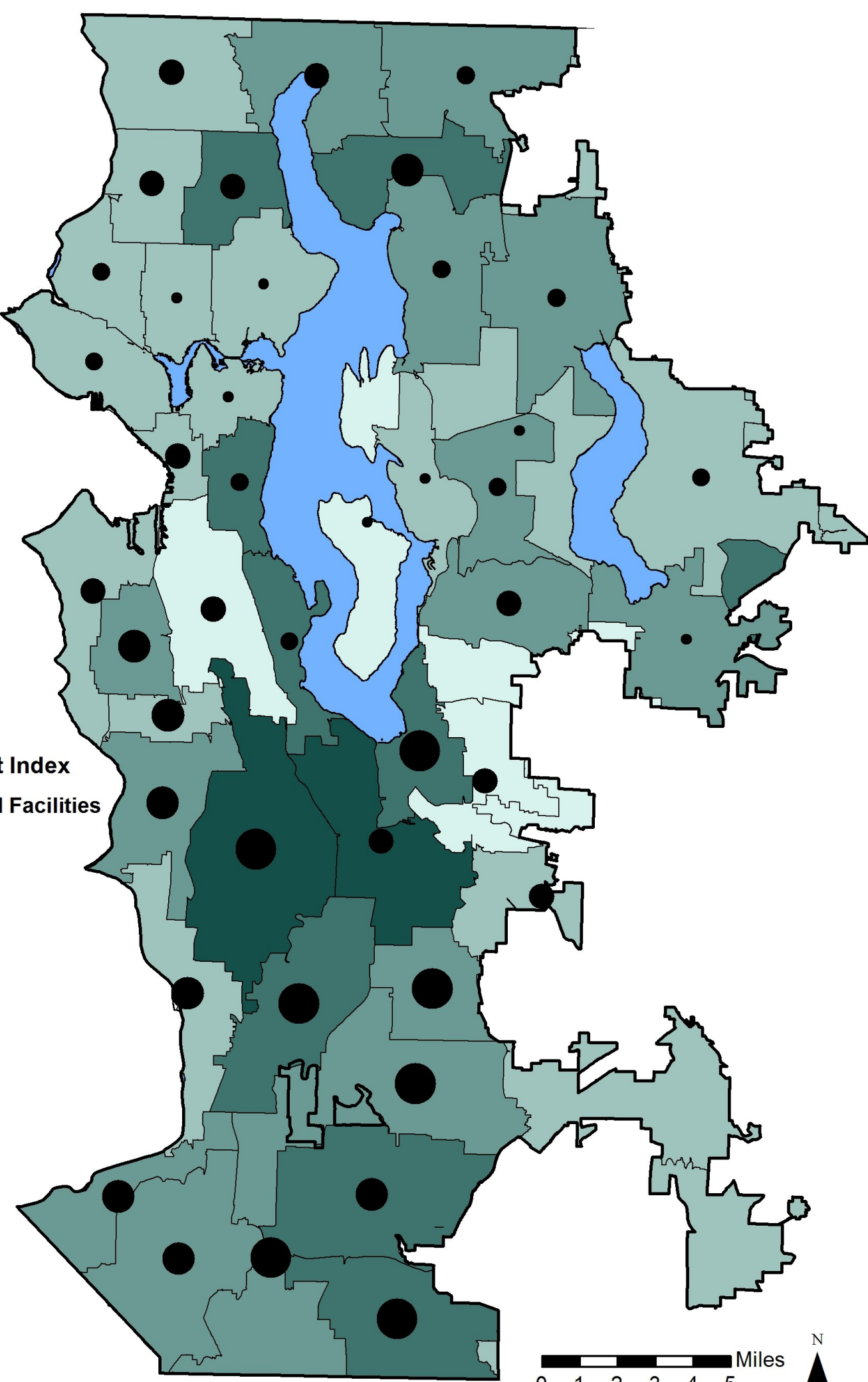
This project uses health data from Health Reporting Areas (HRAs), a measure that is based on census block data and is better than zip codes for understanding health outcomes because it splits areas according to income levels. Areas with easy access to healthy food were defined as residencies within a quarter mile of a grocery store, farmers market, or bus stop. The bus stop buffer was made from a bus stop shapefile and the grocery store buffer was made after selecting for grocery stores from a food facilities shape file and merging it with a farmers market shapefile. These buffers were overlaid with the health indicator layer for obesity made from data tables from the King County GIS Center.

The final map showing the percent of each health reporting area with easy bus access was made by spatially joining the HRA to the bus stop layer, creating a quarter-mile buffer around the bus stops and dissolving it on the HRA to create separate bus buffer polygons for each HRA. After spatially joining the buffer polygons to the HRA layer and joining the attribute tables, the field calculator was used to find the percent of each HRA covered by the bus buffer. This new layer showing bus coverage by percent of HRA was overlaid with the obesity layer to show the relationship between the two indicators. The obesity layer was also overlaid with the food environment index layer made from data tables from King County to show the relationship to unhealthy food.

Bus Coverage and Obesity Rates by Health Reporting Area



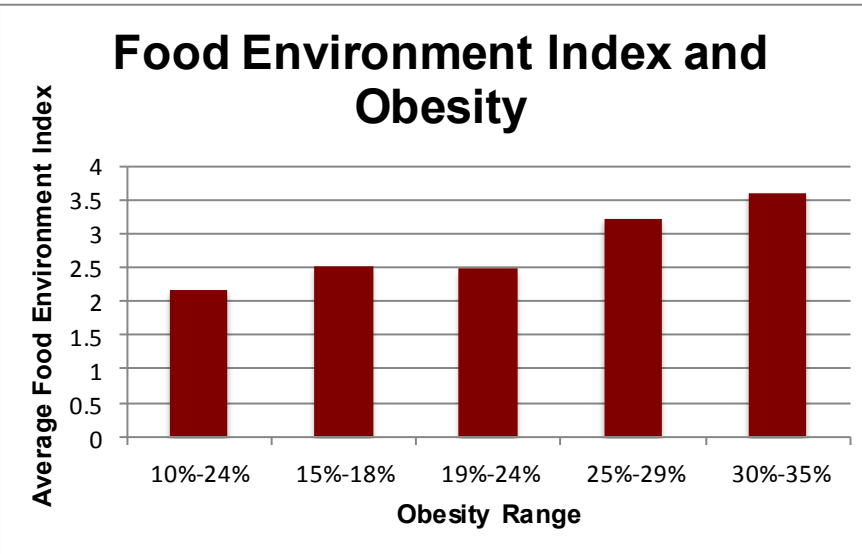
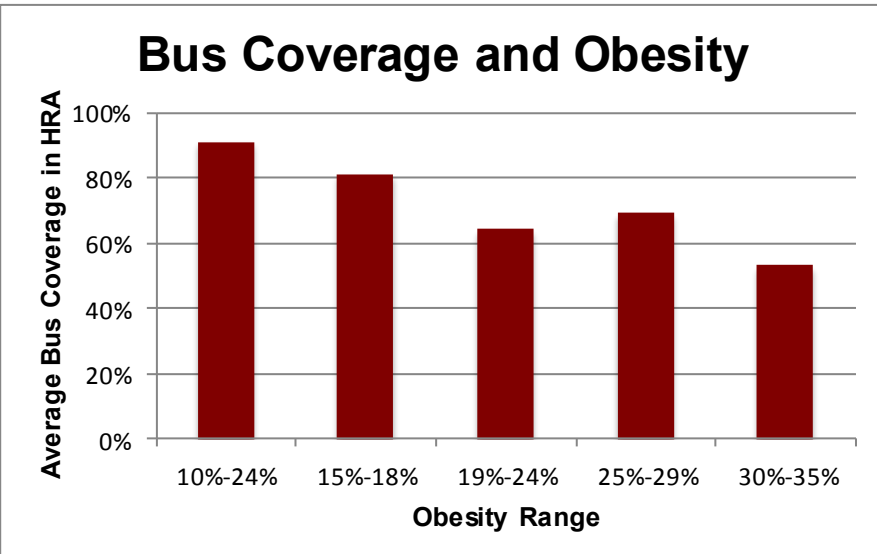
Retail Food Environment Index and Obesity Rates by Health Reporting Area



RESULTS

The final maps indicate that higher obesity rates are consistent with lower bus coverage and a higher food environment index. The graphs help illustrate this point by showing the average bus coverage and food environment index value for each obesity level. This pattern isn't as visible when looking at average obesity rates for bus coverage levels because of variations in income. Looking at the data by obesity ranges avoids the data being skewed by many of the higher income neighborhoods that have poor bus access but low obesity rates. No causal re-

lationships between can be concluded from these maps, but the basic trends are clear. In particular, the food environment index map and graph suggest that it is not only access to healthy food, but access to unhealthy food that has an impact on health. These results indicate that there are disparities in food access in the greater Seattle area that may be affecting the health of residents.



CONCLUSIONS

Food justice means that affordable healthy food is available to all populations. Increasing access not only through transportation routes, but also by neighborhood location of facilities is an important part of achieving equity. Low income groups are some of the most vulnerable populations partly because the most nutritious foods are also the most expensive. Therefore, an important component to add to this analysis would be economic access by rating the cost of grocery stores.

Food is presented, is important to take into account because once in the store shoppers still have to make the decision to choose vegetables over potato chips. Research done at Cornell University has suggested that shoppers can be "nudged" to make healthier choices and have increased enthusiasm about cooking healthy foods. This research suggests that food environment is not limited to the location of homes and grocery stores, but knowing where access and equity can be improved is an important first step towards targeting obesity.

Future research in this area could include a more detailed evaluation of food facilities. The shopper experience, the way the grocery store is set up and the

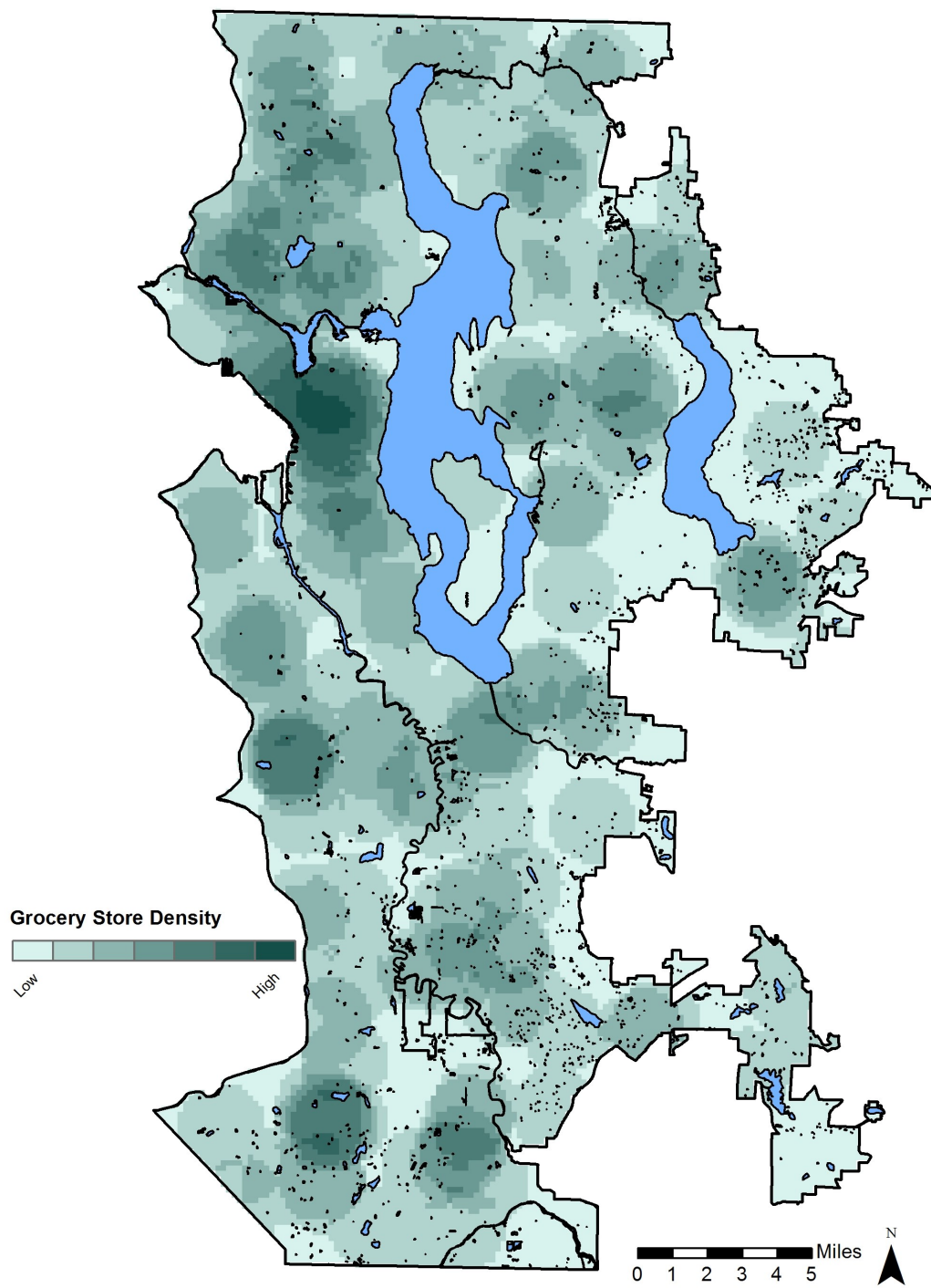
Cartographer: Lydia Jessup
Date: April 29, 2013
Class: Intro to GIS Spring 2013
Professor: Carl Zimmerman
TA: Carolyn Talmadge

Projection:
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Scale: 1:259,499
Data Source: King County GIS Center, King County Department of Natural Resources and Parks

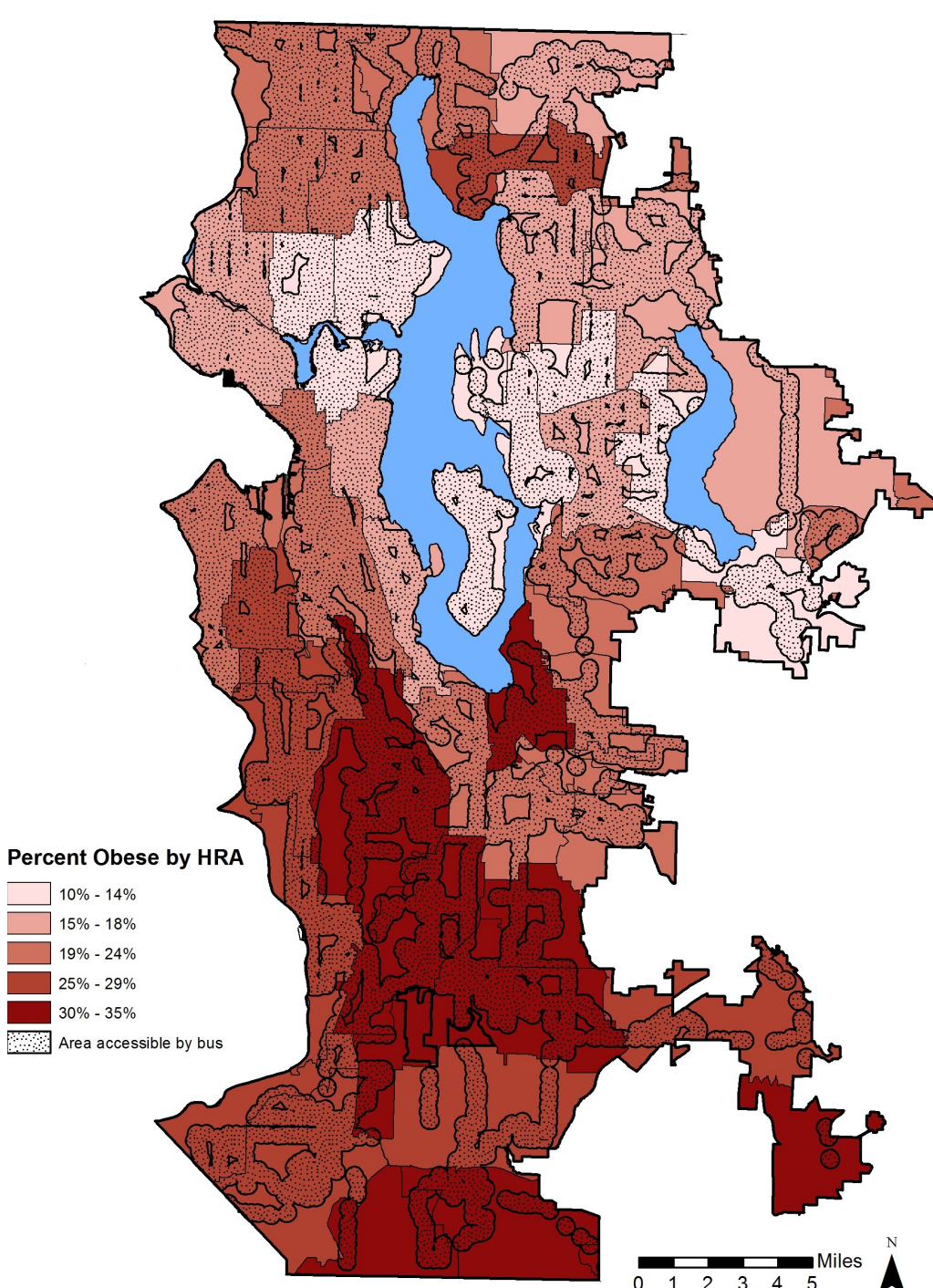


FOOD ENVIRONMENT AND ACCESS

Grocery Store Density



Bus Coverage and Obesity



Walking Access and Obesity

