

Identifying Food Deserts in Madison, WI

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Objectives

- ▶ The purpose of this research project will be to study the prevalence of food deserts within the various neighborhoods comprising the city of Madison, Wisconsin.
- ▶ Plotting neighborhood locations vs. supermarket/grocery store locations on the map will provide an intuitive visualization approach that can be used to drive future research in these areas of interest that were identified.
- ▶ A risk intensity can be derived from studying overlapped coverage areas to determine which neighborhoods can be monitored as potential deserts as the landscape and development shifts.



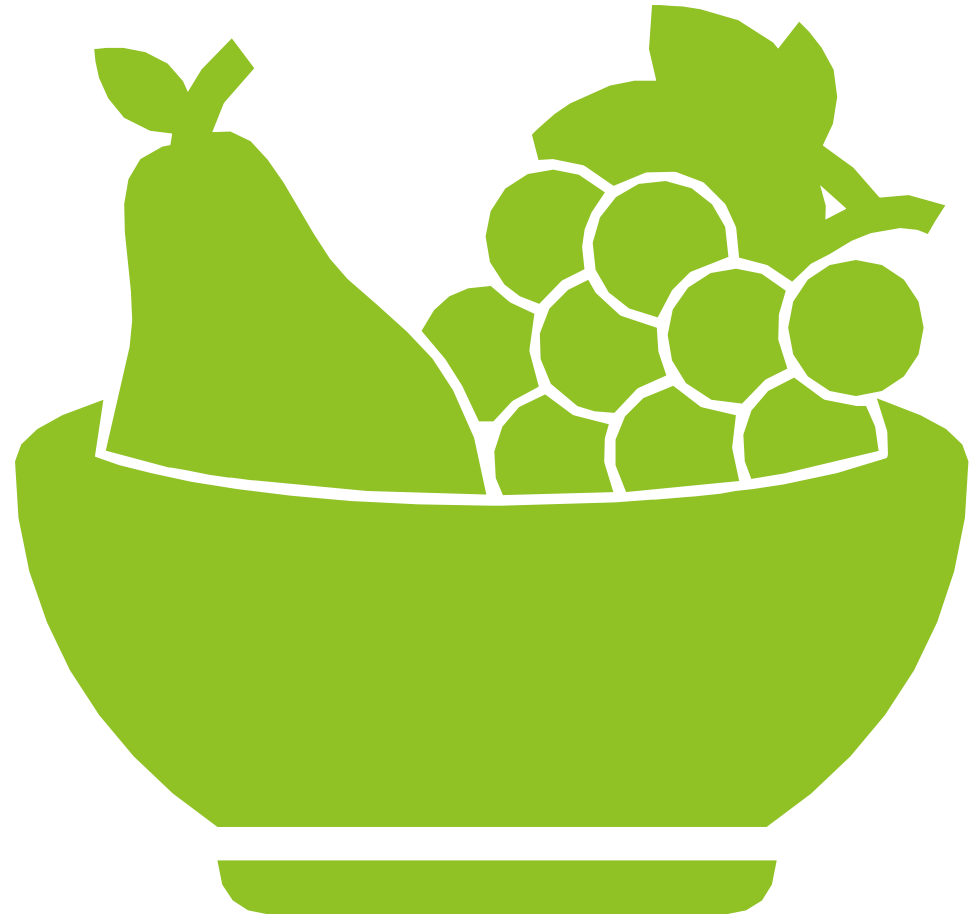
Madison, Wisconsin

- ▶ Madison is the capital of the U.S. state of Wisconsin and the seat of Dane County. As of July 1, 2018, Madison's estimated population of 258,054 made it the second-largest city in Wisconsin by population, after Milwaukee, and the 81st-largest in the United States.
- ▶ The city forms the core of the Madison Metropolitan Area which includes Dane County and neighboring Iowa, Green, and Columbia counties for a population of 654,230.
- ▶ Madison is the fastest-growing municipality in Wisconsin, with a population growth rate of almost 3% in 2011 and 2012. Madison has a high quality of life, which has helped its population grow nearly 11% from 2000 to 2008. By 2030, Madison is projected to have a population of 270,000.

Food Desert Definition

► A food desert is an area that has limited access to affordable and nutritious food, in contrast with an area with higher access to supermarkets or vegetable shops with fresh foods, which is called a food oasis. The designation considers the type and quality of food available to the population, in addition to the accessibility of the food through the size and proximity of the food stores.

► In 2010, the United States Department of Agriculture (USDA) reported that 23.5 million Americans live in "food deserts", meaning that they live more than 1 mile from a supermarket in urban or suburban areas, and more than 10 miles from a supermarket in rural areas.



Stakeholder Identification and Importance

- ▶ Food deserts can occur in all areas of the country, affecting large metropolitan areas the most.
- ▶ Its important that city officials and local governments are aware of food desert locations and those areas of risk.
- ▶ Its also important that community groups, leaders, and constituents are aware of food desert locations, as they will drive the most progress.
- ▶ Finally, business owners & entrepreneurs should see desert areas as opportunities.

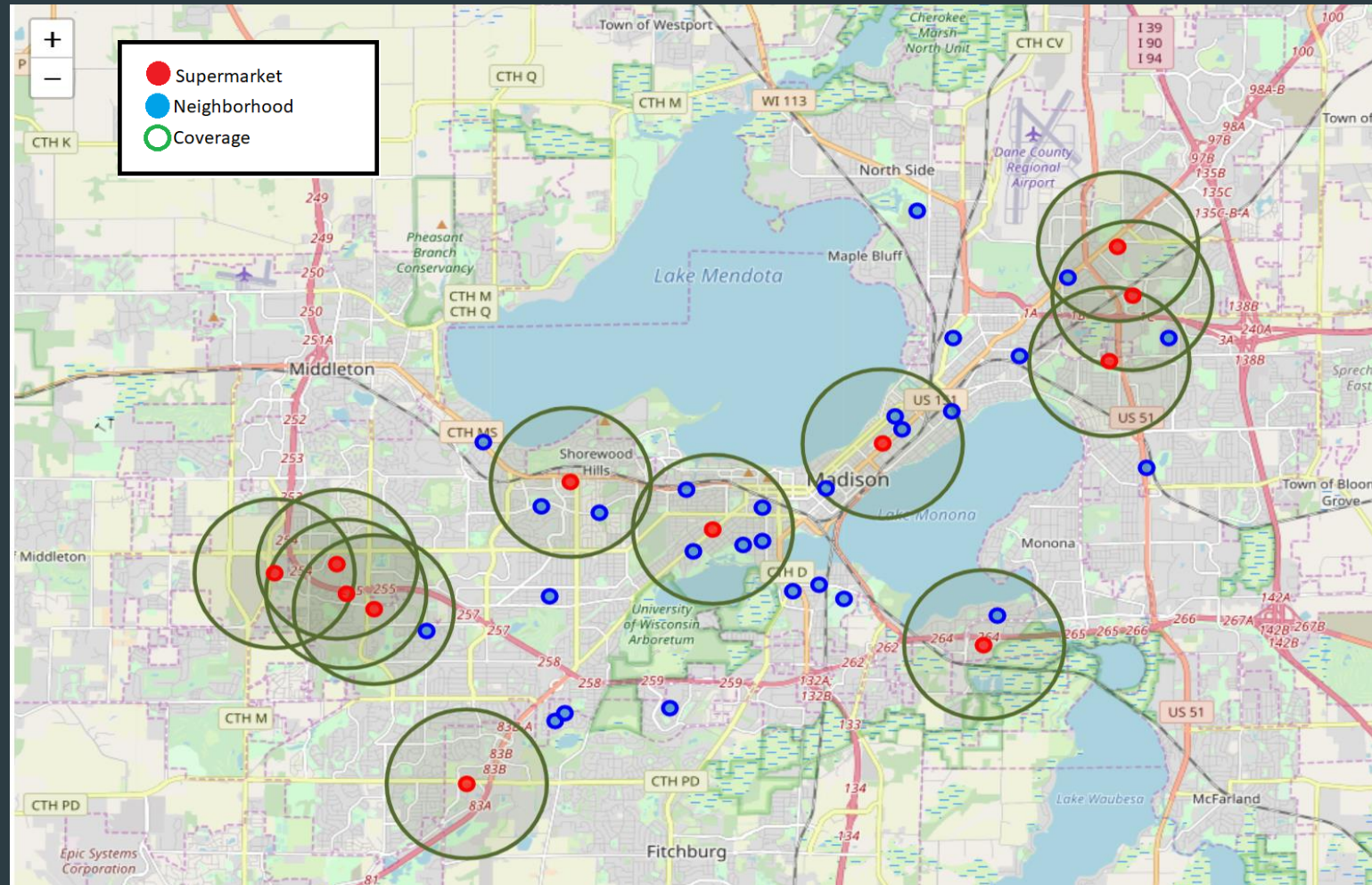
Data Sources & Cleaning

- ▶ Sources: This project will analyze two publicly available datasets:
 - ▶ To identify the unique neighborhoods within the city: <https://data-cityofmadison.opendata.arcgis.com/datasets/neighborhood-plans>
 - ▶ To identify “supermarkets” or “grocery stores” operating within the neighborhood: <https://developer.foursquare.com/places>
- ▶ Cleaning: Converting GIS shape data to coordinates for the neighborhoods (i.e. Latitude & Longitude) was completed using the open source QGIS tool: <https://www.qgis.org/en/site/>

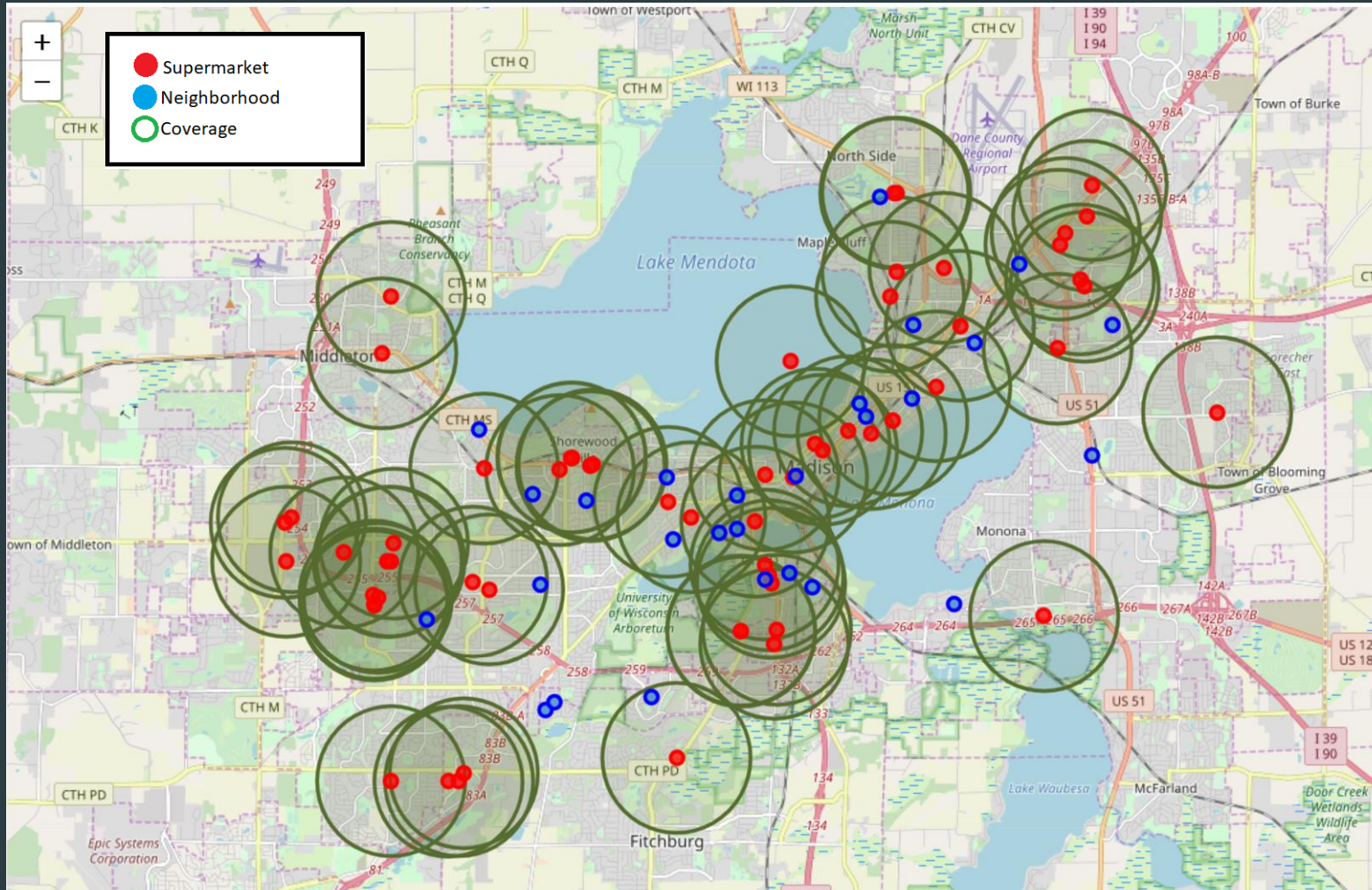
Process & Method

- ▶ From the open city portal data, each neighborhood's latitude and longitude were passed into the Foursquare API.
- ▶ Using a search radius of 5,000 meters (~3 miles), two different search terms were used: "Supermarket", and "Grocery Store"
- ▶ Maps were generated after each API call, using the following criteria -
 - ▶ For each store venue:
 - ▶ A green circle with 10% opacity and a 1 mile in diameter was plotted using the coordinates
 - ▶ A red marker was plotted using the coordinates
 - ▶ For each neighborhood:
 - ▶ A blue marker was plotted using the coordinates

“Supermarket” Map



“Grocery Store” Map



Analysis

- ▶ A large discrepancy is immediately apparent between search terms. A closer look reveals the following:
 - ▶ “Supermarket” key word search is the primary search, however it should be noted a large and populous supermarket chain is missing from the results - Pick-n-Save and Metro Market.
 - ▶ “Grocery Store” key word search is the secondary search, however it over populates with results containing Mom-n-Pop and ethnic grocery stores, which do not always offer the full selection of fresh fruits, vegetables, and meats.
- ▶ A merger of both maps together still have clear areas of the city that identify as a potential food desert, communities within the neighborhoods such as: Broadway-Simpson-Waunona, Allied-Dunn's Marsh, Southwest, Stoughton Road Revitalization Project, South Madison.

Conclusion

- ▶ Although the Foursquare API is promising and can provide a large amount of rich venue content, it seems to be an unreliable source for this type of study.
- ▶ Still, the tool did provide identifiable “areas of interest” for which further research can be conducted. This may aid community members, leaders, city and government officials into better decision making as the city continues to expand at a rapid pace.

Reference & Resources

- ▶ Link to the report:
https://github.com/joshjarvey/Coursera_Capstone/blob/master/Capstone%20Class.pdf
- ▶ Link to the code notebook:
https://github.com/joshjarvey/Coursera_Capstone/blob/master/Capstone_Final_Project.ipynb