Food Deserts vs Food Swamps in Dallas, Texas

DESCRIPTION OF PROBLEM

The obesity problem in the low-income communities is growing at an increasing rate which is contributing to many diseases including high blood pressure, diabetes and heart disease. Many studies believe is problem is being driven by Food Deserts and Food Swamps.

Food deserts are areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up a full and healthy diet. Many Americans living in rural, minority, or low-income areas are subjected to food deserts and may be unable to access affordable, healthy foods, leaving their diets lacking essential nutrients.

Food Swamps are communities that are flooded with unhealthy, highly processed, low-nutrient food combined with disproportionate advertising for unhealthy food compared to wealthier neighborhoods. These areas have more fast food and corner stores than grocery stores.

This project will attempt to attempt to identify exactly where the Food Desserts and Food Swamps are located in Dallas, Texas. The audience for which this would serve a particular interest would be

DESCRIPTION OF DATA

I will be using the following data:

dallascityhall.com – Provides geographic information about the City of Dallas

Wikipedia – Provides additional geographic information about the City of Dallas

Foursquare – Provides the location information for all of the healthy and non-healthy food categories I will need to determine which areas are Food Deserts vs Food Swamps.

- Farmers Market
- Fish Market
- Grocery Store
- Health Food Store
- Organic Grocery
- Supermarket
- Fruit & Vegetable Store
- Fast Food Restaurant
- Convenience Store
- Liquor Store

List of 10 Categories Included in Analysis

	Venue Category	Category ID	Total
1	Grocery Store	4bf58dd8d48988d118951735	45
2	Health Food Store	50aa9e744b90af0d42d5de0e	23
3	Fast Food Restaurant	4bf58dd8d48988d16e941735	20
4	Farmers Market	4bf58dd8d48988d1fa941735	19
5	Liquor Store	4bf58dd8d48988d186941735	19
6	Convenience Store	4d954b0ea243a5684a65b473	17
7	Fruit & Vegetable Store	52f2ab2ebcbc57f1066b8b1c	6
8	Organic Grocery	52f2ab2ebcbc57f1066b8b45	6
9	Fish Market	4bf58dd8d48988d10e951735	3
10	Supermarket	52f2ab2ebcbc57f1066b8b46	3

List of Venues Included in Analysis

#	Venue Name	Total
1	Missing	16
2	Kroger	12
3	Whole Foods Market	12
4	GNC	10
5	Chick-fil-A	7
6	Trader Joe's	7
7	Natural Grocers	6
8	Walmart Supercenter	6
9	Whataburger	6
10	7-Eleven	5
11	Central Market	5
12	Tom Thumb	4
13	Cox Farms Market	3
14	McDonald's	3
15	Sprouts Farmers Market	3
16	Ann's Health Food Center & Market	2
17	Cbd Kratom	2
18	Empire Nutrition	2
19	Fitness Essentials	2
20	Goody Goody Liquor	2

#	Venue Name	Total
21	Grabbagreen	2
22	Sundrops Vitamins & Nutrition	2
23	Total Nutrition	2
24	Ultimate Sports Nutrition	2
25	Walmart Neighborhood Market	2
26	7-Eleven / Exxon	1
27	Amberjax Fish Market Grille at Trinity Groves	1
28	Beverage Depot	1
29	Bountiful Baskets Garland Pickup	1
30	Bueno Produce	1
31	CVS pharmacy	1
32	Cheap River Liquor Beer Wine	1
33	Dallas Farmers Market	1
34	Farmers Fruit And Vegetable	1
35	Hill Town Beverage Beer & Wine	1
36	In-N-Out Burger	1
37	Lovers Seafood And Market	1
38	Medallion Discount Liquor	1
39	Parkit Market	1
40	Paul Quinn College Farmers Market	1

#	Venue Name	Total
41	Paul's Fresh Produce	1
42	South Mill Dallas	1
43	Sowell Liquor Stoe	1
44	Spec's	1
45	Spec's Liquor Store	1
46	Spec's Wine and Liquor Store	1
47	Spiceman's FM 1410	1
48	TJ's Seafood Market	1
49	Taxco produce	1
50	The Best Sun Produce	1
51	The Market at Bonton Farms	1
52	Total Wine & More	1
53	Tyler Farmers Market	1
54	Tyler Street Market	1
55	Urban Acres Co-op Pickup	1
56	Urban Acres Lake Highlands	1
57	Viva Market	1
58	WIC Market	1
59	Wendy's	1
60	White Rock Local Market	1
61	Wic Market	1

List of Zip Codes Included In Analysis

#	Zip Code	Total
1	75206	19
2	75231	15
3	75230	11
4	75204	9
5	75201	8
6	75208	8
7	75235	8
8	75209	7
9	75219	7
10	75214	5
11	75218	4
12	75220	5

#	Zip Code	Total
13	75287	5
14	75205	4
15	75225	4
16	75238	4
17	75243	4
18	75207	3
19	75224	3
20	75226	3
21	75248	3
22	75202	2
23	75237	2
24	75240	2

#	Zip Code	Total
25	75244	2
26	75254	2
27	75261	2
28	75080	1
29	75211	1
30	75212	1
31	75215	1
32	75223	1
33	75228	1
34	75241	1
35	75246	1
36	75247	1
37	75252	1

This data will be combined so I can properly cluster the food establishments over the neighborhoods of Dallas, Texas.

METHODOLOGY

I chose the Dallas, Texas to do my analysis as I am born and raised here. I felt it would give me an instant ability to get a sense of how accurate the Foursquare data really is. For the center of my radius, I chose the longitude and latitude points of Dallas City Hall. The City of Dallas is approximately 385.8 square feet which makes an approximate diameter of 19.64 miles from Dallas City Hall to the farthest edge. Since the radius variable in Foursquare is in meters, the converted diameter distance is 31,610 meters.

For the 10 food categories, I pulled one dataframe at a time and combined them into one dataframe. After combining the data, I immediately noticed the following issues that needed to be resolved:

1. The population contained all of Dallas County as opposed to only the City of Dallas proper.

   To correct this, I filtered out all rows in the city column that were not Dallas and that were NAN.

2. The venue categories were either mis-classified or not consistently classified.

   To correct this, I manually went through all 10 venue categories to attempt to standard the classifications. Even though I was very specific the categories I pulled, the query added additional categories such as Big Box Store, Burger Joint, Fried Chicken Joint, Gas Station and Pharmacy. This was very time-consuming

3. Of the 80 zip codes in Dallas, only 36 were captured that were primarily in the Northern part of the city.

   There was no solution for this missing data.

To determine where the food desert and food swamps were located, I used the K-Means methodology to cluster the venues by the latitude and longitude coordinates. This would provide a clear picture of how low-income and high-income neighborhoods were impacted.

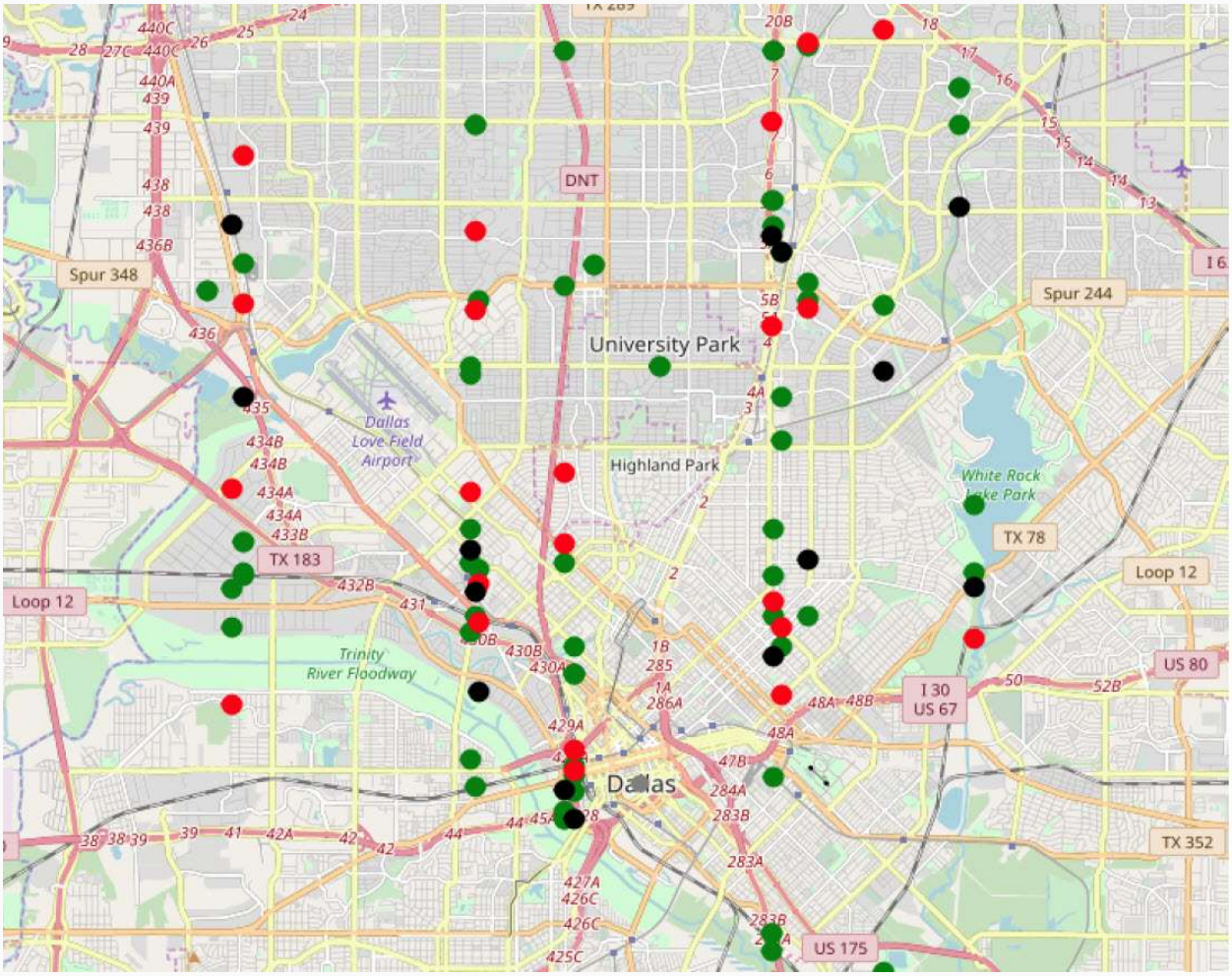
RESULTS

The missing zip codes in the Foursquare data significantly hindered a proper analysis of the food deserts and food swamps as only the northern part of the City of Dallas was captured. Even two the zipcodes from where I was raised (75216 and 75227) were missing and as a result had no data points for healthy foods nor fast foods.

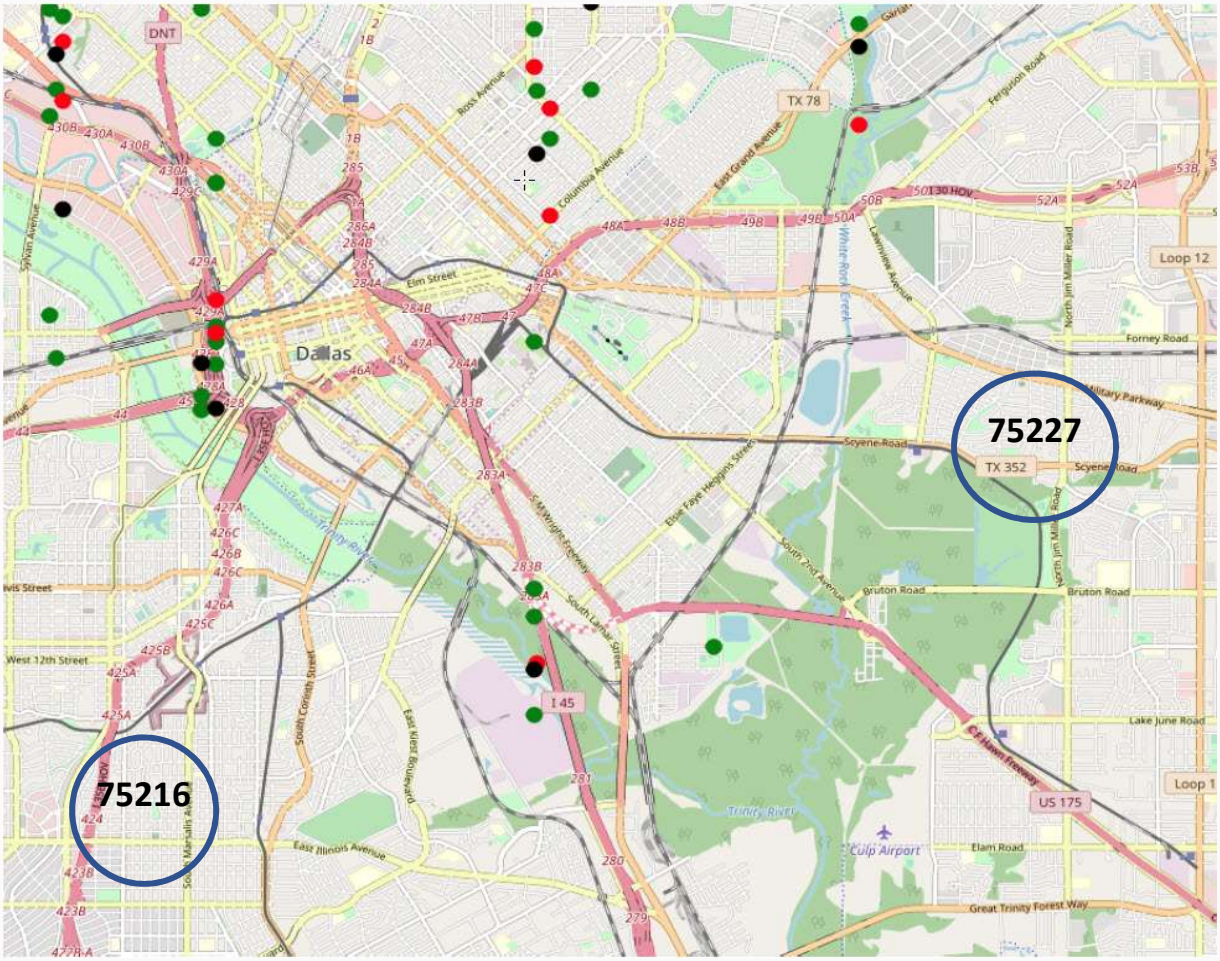
Based on the data that was available, it appears that the higher income sections of the city do not contain food deserts nor food swamps.

Healthly vs Non-Healthy Foods

As you can see the data points are only located in the northern point of the city. Red means unhealthy and green means healthy. The black circles represent liquor stores.



The Southern Part of Dallas and represents most of the missing data. This area includes the zip codes from which I was raised (75216 and 75227). There are tons of fast food restaurants in this area!



DISCUSSION SECTION

Not being able to compare the data points from both upper and lower income neighborhoods makes it impossible to gain meaningful insights. I would recommend, that more freedom is given from which to obtain data for future assignments.

CONCLUSION

In conclusion, there appeared to be no food deserts nor food swamps in the data as only 36 of 80 zip codes were available. The missing zip codes seemed to primarily be located in the lower income parts of the city. This made it impossible to provide a real analysis. In addition, even with the data that was available, there were lots of items that were miscategorized which further hinder the integrity of the information.