

# An Analysis of the Assumed Spatial and Temporal Relationships Underlying the Food Desert Discourse

Sydney Giacalone, Tufts University Advanced GIS, Spring 2017

## Introduction

In the past decade, there has been a proliferation of “food desert” maps at the USDA and municipal level, with many cities asserting that the USDA’s map does not accurately identify their city’s food access problems<sup>1</sup>. Baltimore’s Food Environment Map, created every two years since 2012 by city planners and the Center for a Livable Future, has been recognized as the urban food desert mapping project to follow<sup>2</sup>. To build the city’s official food desert map, this project uses three common metrics—income, distance to supermarkets, vehicle availability—as well as a unique metric: Health Food Availability Index scores surveyed from over 800 food stores in the city every two years on the presence of healthy food in that store. This city’s mapping process is also unique in its explicit recognition of the historical reasons for low food access in low income and minority areas of the city: mappers attribute the food deserts they observe to mid-20th century racist and classist “redlining” practices within planning and investment<sup>3</sup>.

In my full thesis, I argue that the food desert discourse frames causation of food inequalities in the defined past and conceptualizes interventions on a readable timeline of “progress,” delegitimizing residents’ experiences and possible solutions. Within this GIS analysis, I aimed to test my critical anthropological arguments about this framing of temporal and spatial relationships with quantitative data. First, while Baltimore’s mappers take the relationship between 20th century redlining and spatialized food inequality today as given, I ask: How do these historical maps relate spatially to the location of “food deserts,” demographics, and food store quality in Baltimore? Second, I ask: what metrics not currently considered by this project as within the scope of food mapping are spatially related to this issue? Through these questions, I use GIS to investigate the relationships taken for granted during the construction of food desert maps in order to question these assumptions and understand the spatialization of this landscape and the technopolitical mapping processes that mold it as part of the same story.

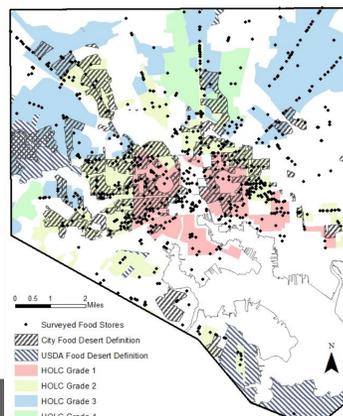
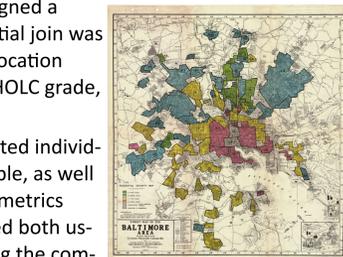
*“Honestly in Baltimore, that map is the exact same map as the poverty map. It’s the exact same as infant mortality. It’s the exact same as redlining. This is all very systemic, historical policy decisions frankly based on race in the 1920s and 30s and 40s [which have] created these areas in the city”*

*—Sarah B., Baltimore’s Food Access Planner*

## Methodology

Baltimore City Planning provided the point layer of 806 food stores with their HFAI score collected in 2014, as well as their polygon desert layer. Polygon layers digitizing each of the 1932 Home Owners Loan Corporation (HOLC) map “redlining” grades were downloaded from ARCGIS Open Data. Demographic data (2015 American Community Survey 5-Year) was downloaded at the block group level. First, separate HOLC layers were assigned a grade from 1 to 4 and merged. Next, a spatial join was used to assign each store the data for its location from the following layers: demographics, HOLC grade, and desert definition.

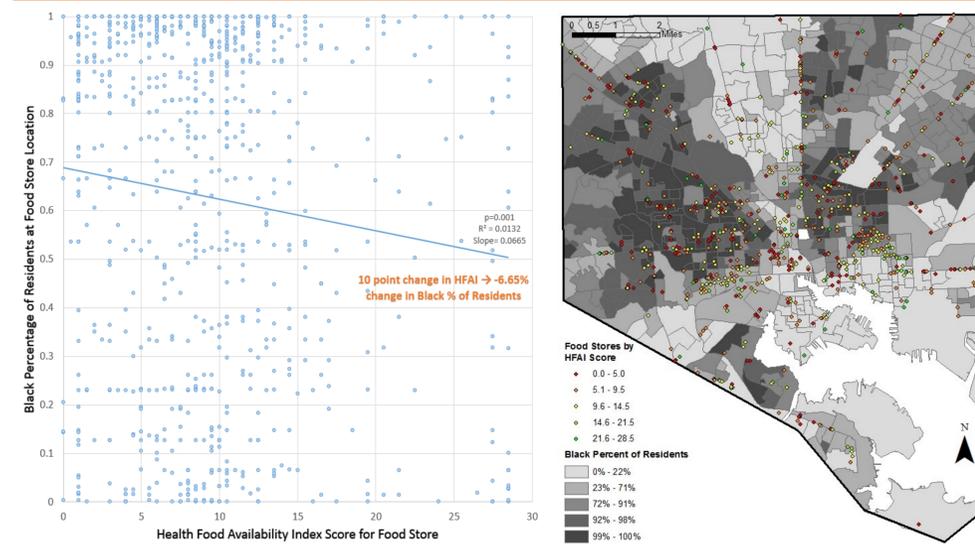
Using GeoDa, regressions were calculated individually for each metric as a dependent variable, as well as combined regressions holding all other metrics constant. These regressions were calculated both using food stores as the spatial unit (assessing the community most served by the residents, the store’s block group) as well as again using block group themselves as the spatial unit. For regressions using HOLC grade as the independent variable, only stores located in a previously graded area were included (592 of 806). In ArcMap, a Local Moran’s I was calculated for store HFAI scores to identify clustering. Exploration of GeoDa scatterplots was used to identify trends or outlying store points for further inquiry. For these stores, my geocoded photos and mapper interview excerpts from my fieldwork were used to inform analysis.



1932 Home Owners Loan Corporation (“Redlining”) Map Original + Digitized, Overlay: City Desert Layer and HFAI-Scored Stores

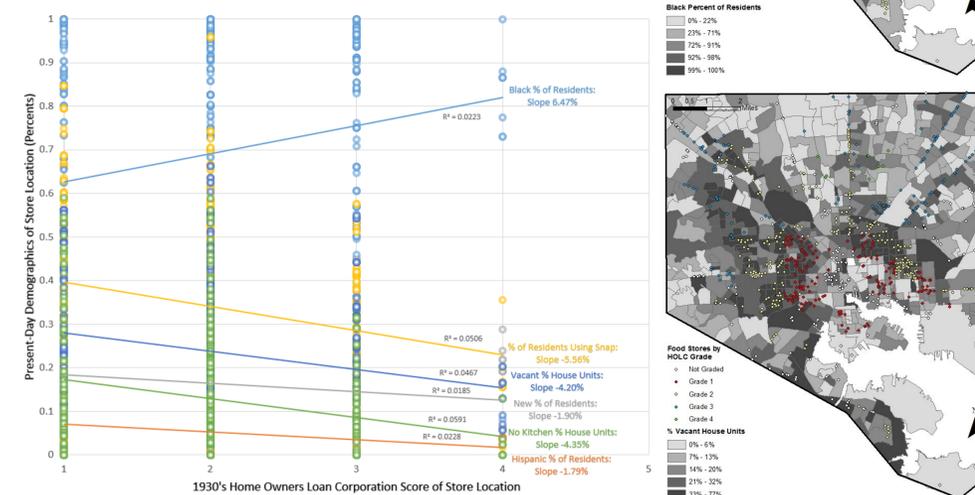
Regression results for data at food store locations are shown to the right, with statistically significant correlations ( $p < 0.05$ ) highlighted. The top chart considers each metric individually, while the bottom chart considers a selection of these metrics while holding all other metrics constant. Regressions by block group are not shown but were consistent with the store-based findings. For HFAI scores, the only significant correlation was the black percentage of residents (graph and map below). With all else constant, this correlation reduced but remained relatively significant ( $p = 0.08$ ). For HOLC grades, the significant correlations are also shown in the below graph and maps. Most findings were as predicted, except for the positive correlation between an increased (“improved”) HOLC grade and the black percentage of residents. This result and other noteworthy correlations are discussed below.

## Healthy Food Availability Score and Black Percent of Residents at Store Location



## Store’s Location In 1930’s Redlining Map and Present Day Demographics

Each statistically-significant correlation can be read as the predicted percent change in that metric given a one unit increase in the HOLC grades 1-4. Percentages of vacant house units, residents using Snap, and units without functioning kitchens show particularly negative relationships to HOLC grades: a food store located in a HOLC better-graded area is likely to have lower measures of these metrics. However, this relationship is surprisingly reversed for percentages of black residents: a food store located in a HOLC better-graded area is likely to have a higher percentage of black residents. This directly contradicts the causal relationship between food desert “at risk” (minority and low income) residents and redlining that Baltimore mappers assume. Reasons for this are hypothesized further in the section to the right.



## Results

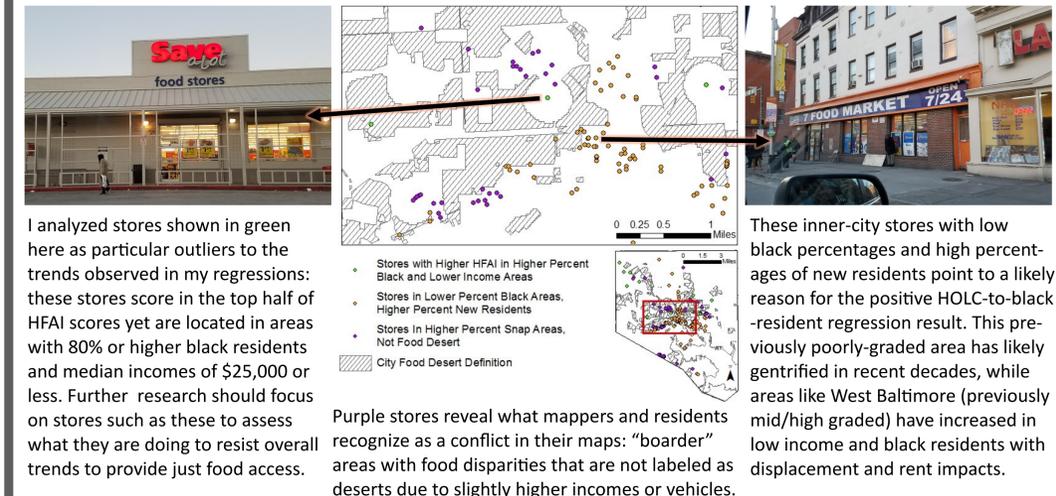
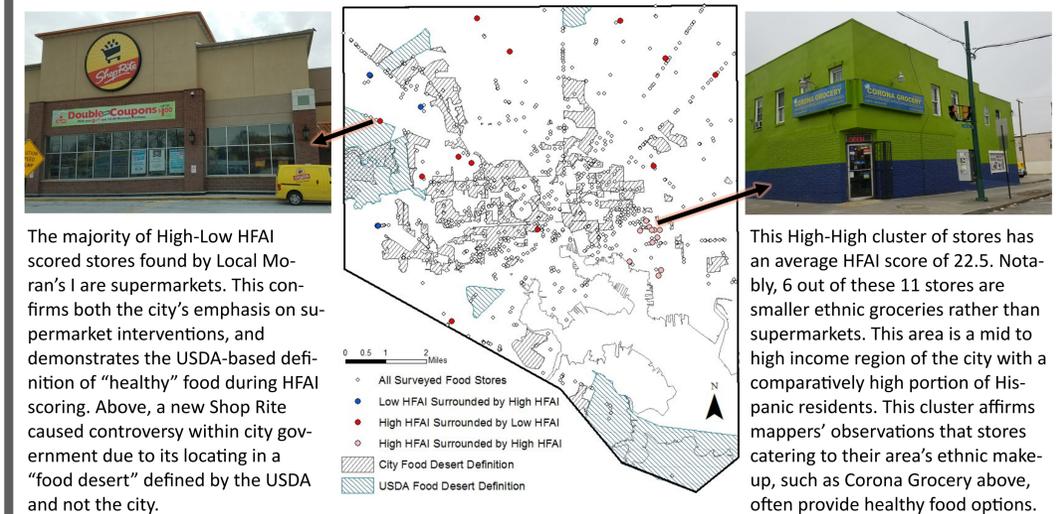
Dependent Variable	Independent Variable									
	HFAI Score by 10 points	Desert Score by 1 point	HOLC Grade by 1 point	Percent Black by 10%	Percent Hispanic by 10%	Percent New Res. by 10%	Median Income by \$10,000	% Using Snap by 10%	% Vacant Units by 10%	Percent No Kitchen by 10%
HFAI Score		3.23	-0.62	-0.203	0.23188	-0.06	4.94%	-0.09	-0.06	-0.07
Percent Black	-6.52%	-32.02%	6.47%		-16.20%	-5.40%	-4.04%	8.50%	7.90%	7.80%
Percent Hispanic	0.49%	2.79%	-1.79%	-1.10%		0.80%	0.71%	-0.90%	-0.60%	-0.70%
Percent New Residents	-0.21%	2.02%	-1.90%	-0.50%	1.20%		0.37%	-0.70%	0.40%	-0.20%
Median Income	\$950.09	\$7,252.06	\$779.49	-\$2,422.12	\$6,485.55	\$2,159.64		-\$2,577.65	-\$1,804.65	-\$2,961.40
Percent using Snap	-1.00%	-15.71%	-5.56%	2.90%	-4.80%	-2.50%	-1.48%		7.20%	8.30%
Percent Vacant Units	-0.38%	-9.32%	-4.20%	1.40%	-1.70%	0.60%	-0.55%	3.80%		9.30%
Percent No Kitchen	-0.36%	-9.55%	-4.35%	1.20%	-1.70%	-0.30%	-0.79%	3.90%	8.10%	

HFAI Score (R <sup>2</sup> =0.04)		3.22	-0.02	-0.147	-0.06	-0.20	-2.04%	0.14	0.12	0.07
Percent Black (R <sup>2</sup> =0.48)	-2.56%	-15%	6.99%		-10.20%	-1.90%	-2.02%	5.40%	5.40%	-4.40%
Median Income (R <sup>2</sup> =0.11)	-\$363.67	-\$1,335.19	\$349.88	-\$2,074.66	\$2,929.52	\$474.10		-\$310.07	\$3,648.95	-\$4,382.71

## Exploring Local Moran’s I Clusters and Outlying Trends To Inform Future Research

Below, I highlight specific store clusters or outlying trends using my GIS analysis and qualitative ethnographic research to inform each other during analysis. All photography of specific stores was collected during my fieldwork.



## Conclusions

These findings demonstrate that it is essential to question the fundamental assumptions underlying food desert map making and intervening. The regressions between many of the metrics Baltimore’s mappers use within their map or take as causally-related to their map show that these relationships vary: some assumed relationships are indeed significant, some are unfound or not significant, and some are in fact the opposite of what mappers assume. Taking these findings seriously means reevaluating how these assumed relationships impact the picture of food access these mappers are creating as well as the temporal framing put forward by this discourse. Current framing of food’s spatialization as due to historic redlining proves inadequate to understand this phenomenon, warranting further analysis of the spatial relationship between present-day structural racism (such as data showing this in Baltimore’s vacancies or interest rates<sup>4</sup>) and particular attention during intervention creation to food stores that resist overall trends in order to provide just access to healthy, culturally-appropriate food.

NAD 1983 2011\_StatePlane\_Maryland\_FIPS\_1900\_FT\_US  
 Projection: Lambert Conformal Conic  
 Data Sources: USDA Food Access Research Atlas (2015), American Community Survey 2014 5-Year, US Census, The Reinvestment Fund (2013), USDA Food & Nutrition Service SNAP Retail Locator (2014), Maryland Food System Map, Baltimore Neighborhood Indicators Alliance, Maryland Behavioral Risk Factor Surveillance System (2014), Center for a Livable Future (2016) ArcGIS Open Data  
 Photo: Emily, “50 Food Places to Watch: Growing Food Access Through Local Government Action,” *Reinvestment Fund Review* Summer 2015, <http://www.reinvestmentfund.org/2015/05/15/50-food-places-to-watch-growing-food-access-through-local-government-action/>  
 Academic literature since 2008 and Review of Crime CS Based Food Mapping Resources: “CR, Blacktopography, JJ (2), 123-128.”  
 @11/17/2016 02:12:59Z  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website. <http://www.flavorsofokland.com/redlining-to-food-deserts-a-historical-overview/>  
 “Redlining, N. (2012). *From Redlining to Food Deserts: A Historical Overview*. Retrieved from the *Flavors of Oakland* website.



