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GIS Assignment 6  
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**Project Description**
The purpose of this project is to examine the relationship between poverty status and access to healthy foods in the city of Washington, DC. I will be assessing the accessibility of grocery stores and community gardens, both of which provide nutritious foods, in all eight Wards of Washington, DC. I will be examining individual poverty rates throughout the city of DC at the Census Tract level. This is an important topic to study as food security and insecurity are directly related to health status. Some questions that I hope to answer are:

1) In what neighborhoods is access to grocery stores poorest?  
2) In what neighborhoods is access to community gardens poorest?  
3) Is there a relationship between poverty status and access to grocery stores?  
4) Is there a relationship between poverty status and access to community gardens?  
5) Is there any Ward that has good access to both grocery stores and community gardens? And does access to these nutritious food sources correlate with income status?

**Similar Analyses**
*Factors protecting against and contributing to food insecurity among rural families - Olson et al.*

In this study by Olsen et al. (1996), researchers measured the factors contributing to food insecurity in a rural upstate New York county. Food insecurity was defined as “whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain” (Anderson 1990). One hundred and ninety three women between the ages of 20 and 40 were asked questions relating to access to food sources, participation in food programs, and socioeconomic status. The researchers found that the variables significantly contributing to food insecurity included a lack of savings and having unexpected expenses. In addition, one significant variable that led to low levels of food in the house was “no vegetable gardening.” According to Olsen et al. (1996), “approximatly 20 percent of those interviewed] reported they shopped where they did because it was the only store in the area.” The findings of this study support the hypothesis that there is a relationship between socioeconomic status and access to nutritious foods.

**Reference:**

*Health Food, Healthy Communities: An Assessment and Scorecard of Community Food Security in the District of Columbia*

In a comprehensive study by DC Hunger Solutions as part of a ten-year campaign to end childhood hunger, this report generated ratings of “community food security” (CFS) for all eight Wards of Washington, DC. CFS is defined as a “food security-promoting strategy that considers all the factors within a region or community’s food system that influence the availability, cost, and quality of food to area households, particularly those in lower income communities” (p. 4).
After careful assessment of all factors relating to CFS, including the surveying of grocery and convenient stores and farmers markets, the key findings of the report include:

1) Grocery stores are not evenly distributed throughout the city
2) Many corner markets, which low-income communities rely on when there is no grocery store, have limited affordable, healthy items in stock
3) Farmer’s markets are unequally distributed throughout the city and require too much annual red tape to start-up and keep them going
4) 80% of community gardens are concentrated in the neighborhoods of Upper Northwest & Capitol Hill

The wards were rated on their levels of food security, with the best score possible being an A+ and the worst score possible being an F. Ward 3 ranked highest, with a score of B, followed by Ward 6 (B-), Ward 2 and Ward 4 (C+), Ward 5 and 7 (C), Ward 1 (C-), and worst of all, Ward 8 (D-). Ward 8 is also the poorest area of the city.

Reference:

Nutritional and Health Consequences are Associated with Food Insecurity among U.S. Elderly Persons - Lee and Frongillo

In this study by Lee & Frongillo (2001), data from the Third National Health and Nutrition Examination Survey (NHANES III) and the Nutrition Survey of the Elderly in New York State (NSENY) were examined in order to assess the nutritional and health consequences associated with food insecurity for elderly individuals in the United States. In this process, it was determined that the greatest risk factors for food insecurity in the elderly population include: poverty, minority status, participating in food assistant programs, living alone, and living in metropolitan New York City. While this study only looked at the elderly population, it clearly supports a correlation between food insecurity and socioeconomic status.

Reference:

Grocery stores scarce for many DC residents - Lynda Laughlin

According to this article written by demographer Lynda Laughlin, the distribution of grocery stores in Washington DC is uneven, which can have a large impact on quality of life and health. Laughlin argues that the uneven distribution of grocery stores disproportionately affects those in poverty-stricken neighborhoods. The wealthier Wards 2 and 3 have 16 grocery stores, which is one store for every 8,911 residents. On the other hand, Ward 4 only has one grocery store for 75,000 people, and in Wards 7 and 8 there are only three grocery stores, or one for every 47,151 people. Laughlin states: “Wards 4, 5, 7, and 8 are all majority African-American and all have large numbers of residents living in poverty, while wealthier, whiter Wards 2 and 3 have almost half the city’s grocery stores.” Laughlin states that DC needs to lure more grocery stores into poorer neighborhoods and convince convenience stores to sell more nutritious items in order to reduce the health burden on the city’s poorest residents.
Methods
After locating all appropriate data sources, this analysis will most likely require the geocoding of data from either Reference USA or from DC Hunger Solutions (the organization that produced the comprehensive report on Community Food Security in DC). After all data has been added, the “Select by Attribute” and “Select by Location” tools will be used frequently to determine what areas contain/are within a certain distance of grocery stores and community gardens. In addition, in order to determine proximity to grocery stores and proximity to community gardens, I will need to use the “Buffer” tool. The “Clip” tool is another option for selecting areas within walking distance to a grocery store or community garden.

Necessary Data Layers
1) DC City Boundary data layer - available at ESRI or DCGIS
   - Minimum Accuracy: within 50-100 feet of the actual city boundary line
2) DC Ward Boundary data layer - available at DCGIS
   - Minimum Accuracy: within 50 feet of the actual ward boundary lines
3) Streets data layer - available at ESRI or DCGIS
   - Minimum Accuracy: within 100 feet of the actual streets
4) Hydrography data layer - available at ESRI or DCGIS
   - Minimum Accuracy: within 100 feet of the actual water bodies
5) Parks & Recreational Space data layer - available at DCGIS
   - Minimum Accuracy: within 100 feet of the actual park spaces
6) Census Tract individual poverty data - available at ESRI or DCGIS
   - Ideally, I would like to have poverty data at the Block Group level, but I do not think this is possible because it is SF3 data
7) Grocery store data - available at Reference USA
   - I have been trying to locate the GIS/data specialist at the Food Research and Action Center in DC (which produces many nutritional reports) - however, she is difficult to reach
     - This data is ideal, as it was collected by their researchers in 2006
     - I will keep trying to make contact with the data specialist
   - I found from my last assignment that Reference USA grocery store data for the DC area is somewhat flawed
     - Therefore, it will only be used as a last resort for this project
   - Minimum Accuracy: within 50 feet of the actual location of the grocery store
8) Community garden data - available at DC GIS
   - Minimum Accuracy: within 50 feet of the actual location of the community garden