**Food Security: New York City Case Study**

(Includes all background materials for Unit 4 and AGO activity for Unit 5)

**Students Learning Outcomes**

Students will be able to:

1. Identify factors contributing to food security and food insecurity in an urban environment.
2. Synthesize social and environmental datasets to conduct a spatial analysis to identify people and/or areas most vulnerable for food security.
3. Propose ways to increase food security.
4. Communicate research orally and visually (PowerPoint presentation).

**Overview**

Students are part of a special ad hoc committee that has been assigned to create a presentation on the main issues causing food insecurity in New York City to the mayor of New York City. They should incorporate information from the assigned readings and the analyses they do with the following ArcGIS online activity. Additional resources can be included as well. As their final product, students are to create a PowerPoint presentation describing the context of the wicked problem of food insecurity and the potential solutions for the city. The presentation should include one or more maps they create in AGO.

**Unit 4: Pre-class Assignment**

Welcome to New York City! The following readings give you an overview of the demographics, geography, economy, and history of New York City.

Wikipedia: <https://en.wikipedia.org/wiki/New_York_City>

US Census Bureau Quick Facts:

<http://quickfacts.census.gov/qfd/states/36/3651000.html>

Make sure to distinguish the facts pertaining to New York City and to New York State.

Based on these two sources of information, be able to answer the following questions.

1. How would you describe the ethnic and racial diversity in New York City?
2. What type of climate does New York City and the surrounding region have? Is this an area that is good for growing crops and raising animals for food? Why or why not?
3. What type(s) of challenges does New York City face from climate change? How might this/these challenges impact the growing and raising of food within and around the city as well as the distribution of food to and within the city?
4. Do you think people grow food in New York City? If so, where?

**Unit 4: In-class Materials**

*Where is the food coming from that people eat in New York City?* Explore these resources.

Explore the website on urban agriculture, <http://www.fiveboroughfarm.org/urban-agriculture/>

Be sure to watch the video on the home page, read about the 4 types of urban agriculture, and review the slideshow, Explore New York City’s farms and gardens.

Local foods and Community Supported Agriculture (CSA): <http://www.justfood.org/csa>; <http://www.grownyc.org/>. Explore both sites, particularly the parts that focus on CSA and the local food movement.

Hunts Point Food Distribution Center: Read the section on food supply. <http://www.nyc.gov/html/sirr/downloads/pdf/final_report/Ch_13_CriticalNetwork_FINAL_singles.pdf>

This provides a good overview of the vulnerability of one of the largest food distribution centers in the United States.

Based on the readings, be able to answer the following questions.

1. What are the major threats from climate change to the Hunts Point Food Distribution Center?
2. How are foods transported to and from Hunts Point (e.g., air, truck, rail, boat)?
3. Where are food grown or raised in New York City?
4. What types of food are grown within New York City? By whom? For whom?
5. What are the motivations for people to grow or raise food in New York City (e.g., commercial, eat/buy local, etc.)?

*Health in New York City*

Read:

Gordon, C. et al., 2011. Measuring food deserts in New York City’s low-income neighborhoods. Health & Place 17: 696-700.

Based on the readings, be able to answer the following question.

1. What evidence is there to support a relationship between health and other socio-economic data?

Additional Resources

Ackerman, K. The Potential for Urban Agriculture in New York City: Growing Capacity, Food Security, & Green Infrastructure. Urban Design Lab at the Earth Institute, Columbia University.

Black, J.L., J. Macinko, L.B. Dixon, G.E. Fryer, Jr., 2010. Neighborhoods and obesity in New York City, Health & Place 16: 489-499.

Welikia Project: <https://welikia.org/>

This is a great resource that shows what the Island of Manhattan was like before European Colonization. Historical reconstructions are being done for the other boroughs.

**Unit 5: New York City Case Study ArcGIS Online Activity**

1. Go to this link (copy and paste): <https://www.arcgis.com/home/webmap/viewer.html?webmap=f4ff7e932c9c4199a2194e2ae1f0b680&amp;extent=-74.6606,40.33,-73.2393,41.1158>
2. Sign into your AGO account

Here you will see layers for New York City. A table with the description of the data layers and associated variables is located below. These layers provide an exploration of issues around the topic of food insecurity, such as demographics (e.g., race, age, sex, income), health (obesity), and locations of farmers markets, food coops and community gardens.

1. Explore the data sets.
   1. Look at the tables for each data set. You can click on a column heading to arrange in descending or ascending values.
   2. Change the color of the style for income and the US Census data. For instance, select the column for percent blacks in the census tracts within New York City. Display in a graduated color using natural breaks with 4 classes.
   3. Change the transparency of the top layer so that you can see what is below to identify possible relationships between layers.
   4. Move the order of the data layers in the table of contents to the left. Also, you can turn layers on or off the check mark next to the layer name.
   5. Use the filter function to find those census tracts that have over 30 percent white population.
2. After you get familiar with the data sets, see if you see any patterns within one data set, such as median income or percent obesity. Also see if you see any patterns between the data layers. To get you started, here is an example.
   1. Examine patterns in median income. Zoom into the southern Bronx nearby Hunts Point. Overall, what is the median income for the census tracts in this part of New York City? Next, look at the income of census tracts in Manhattan. How do they compare to the Bronx? What about other places in NYC? How do they compare?
   2. After looking at patterns of income, let’s look at possible relationships between obesity and income. Examine again the southern Bronx and Manhattan. There are definite differences in income. How about obesity? Is there a possible correlation (not necessarily cause and effect) between income and obesity? Do you think there might be similar correlations in other parts of the city?
   3. Next, examine where farmers markets are located. From a visual examination, are they evenly spaced around the city? If not, are they clustered in certain places? Where? Can you explain the clusters?
3. Conduct spatial analysis. Some possibilities include, creating a buffer around the farmers markets to assess the demographics or income of people living nearby. Is there a pattern where food co-ops are located? How about the community gardens? Do you see any relationship between obesity and demographics? You can explore these and many other questions.
4. After conducting your analyses and creating maps, compare your results with your readings, if your questions are discussed in the readings. Do you get the same results? If not, what could be the reasons for the different results?
5. For your presentation, you can do a screen capture of the map you create in AGO and bring this into PowerPoint.
6. Discuss how the spatial analysis and the maps provide information on food insecurity in New York City.
7. What additional data sets would you like in the ArcGIS Online activity? If you would like to search for additional data sets, go to the dropdown arrow by Add and select Search for Layers. In the new window that appears, type in key words to use in your search in Find and chose My Organization for In. Examine the list of possibilities that appears in the Results Found. Click on Add by the dataset you would like. When you have finished selecting your new data sets, click on Done Adding Layers at the bottom.

**NYC Food Security Data Key**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **File name** | **Objects** | **Variable name** | **Description** | **Source** |
| NYC Community Survey  Alias: % Obesity by health district | Polygon - health districts | Obesity | Percent obesity | NYC Department of Health and Mental Hygiene  http://www.nyc.gov/html/doh/html/data/chs-data.shtml |
| NYCIncome  Alias: NYC income, 2014 | Polygon - census tract | Data\_Value | Median income by | US Census Bureau  American Fact Finder |
| NYC\_2010Census  Alias: Demographics, 2010 | Polygon - census tract | TOT\_POP | Total population | US Census Bureau  American Fact Finder |
|  |  | CHILD\_PER | Percent children under 9 years old |  |
|  |  | PER\_9-65 | Percent population between and including ages 9-65 |  |
|  |  | PER\_SENIOR | Percent population over age 65 |  |
|  |  | PER\_MALE | Percent population male |  |
|  |  | PER\_FEMALE | Percent population female |  |
|  |  | MEDIAN\_AGE | Median age of population |  |
|  |  | MEDIAN\_AGE\_M | Median age of males |  |
|  |  | MEDIAN\_AGE\_F | Median age of females |  |
|  |  | PER\_HISP | Percent population Hispanic |  |
|  |  | PER\_WHITE | Percent population white |  |
|  |  | PER\_BLACK | Percent population black |  |
|  |  | PER\_ASIAN | Percent population Asian |  |
|  |  | PER\_OTHER | Percent population other |  |
|  |  | AREA\_SQKM | Area of census tract in square kilometers |  |
|  |  | POPDEN\_SQK | Population density per square kilometer |  |
| NYC\_farmers\_market  Alias: NYC farmers markets | point | Locations and other information |  | Oasis NYC |
| NYC\_food\_coops  Alias: NYC food co-ops | point | name |  | Oasis NYC |
| GrowNYC\_Community\_Gardens\_2015  Alias: GrowNYC community gardens, 2015 | polygon | gardenname |  | GrowNYC |
| DCP\_nyc\_freshzoning  Alias: Fresh zoning, DCP |  |  |  | Department of City Planning  http://www.nyc.gov/html/dcp/html/zone/zh\_ztools\_fresh.shtml |