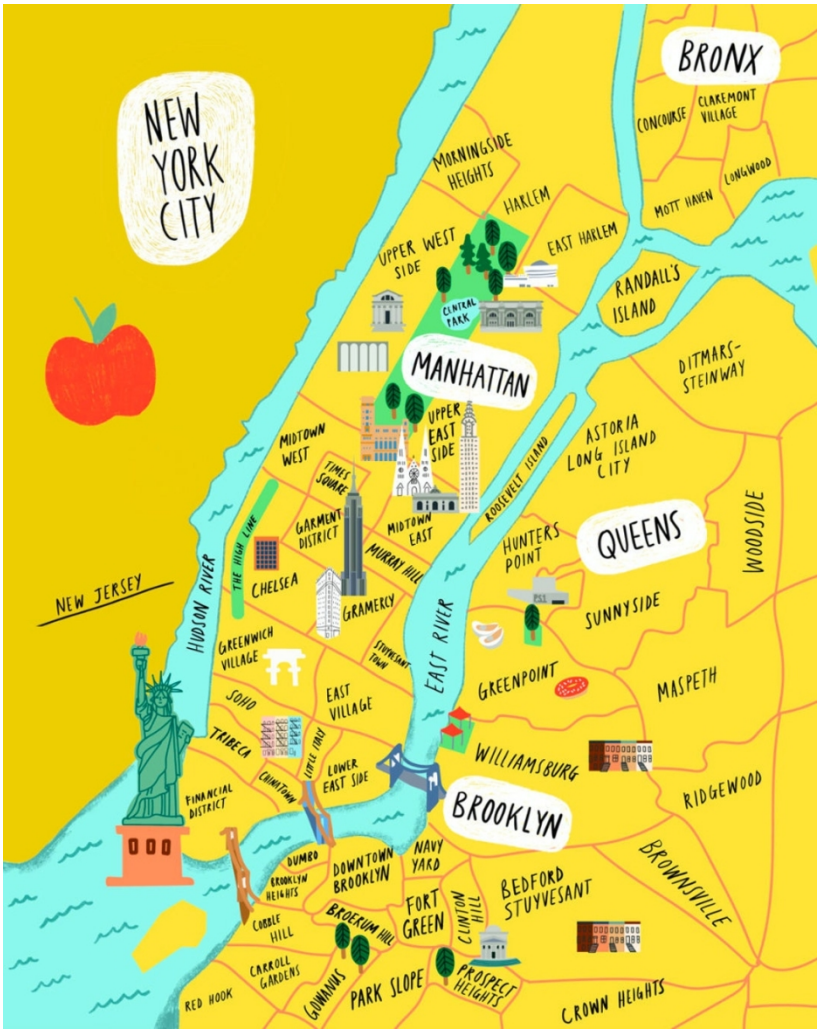
New York Food Desert Analysis



Team Grocery Gurus

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Introduction

About Our Project

This New York Food Desert Project Analysis focused on analyzing the issue of food deserts within the state of New York. Through this project, we were able to cover and uncover the various areas: rural, urban, suburban throughout the state to identify and study characteristics that deem the area a “food desert”

A food desert is identified as low-income tracts of which the proportion of the population has little to low access to supermarkets and large grocery stores that provide healthy food options (especially fruit and vegetables) as well as affordable options.

Project Initiatives and Deliverables

Our core initiatives and deliverables projected for the project goes as follows:

- Data Collection
    - Using the data sources found with the appropriate information, we were use the ETL process to collect the data needed to support our analysis. We were able to collect and cleanse the data to remove redundant and duplicate data.
- Geographical Analysis
    - For our geographical initiative we wanted to be able to show and highlight areas in New York State that lacked the ability to provide accessible foods. We were able to use our data to create a geographic analysis by filtering the data to create Map visuals. These mapping visualizations were able to identify the certain counties within the New York state that have limited accessibility to fresh and healthy foods.
- Demographic Analysis
    - Our intent for demographic analysis for this project was to highlight the average income in the highlighted areas within the New York State that identify as a Food Desert area. As we continued to analyze the data, we were able to study the demographics of the population that lived in the highlighted areas, many of those being considered low-income households.
- Reporting of Data
    - We created dashboards using Tableau Software to report the data given in a visual way. This helped us report the data in way a that many can

understand. For example, having the ability to see the differential color schemes on the Heat Map supports the analysis on low-income areas.

Requirement Gathering

This Requirement Gathering phase of our project happened during our first sprint – Sprint 0 that took place during the weeks of April 15th – April 29th. During this phase, it was important for us to identify what would be needed to ensure that completed all our deliverables, but also what could support us during this project.

Identification of Key Stakeholders

- State Health Officials
- Data Analysts
- Policymakers
- Community Organizations
- GIS Specialists
- Local Government Officials
- Non-Profit Food Organizations

Data Requirement

- Geographical Data
  - Sources: Maps
  - Details: Location of Food Outlets, Distances, Accessibility
- Demographic Data
  - Sources: Census, Economic Reports
  - Details: Income
- Food Outlet Data
  - Sources: Maps. Retail Data
  - Details: Location, Distance

Functional Requirements

- Data Collection and Storage
  - The ability to support large dataset handling and efficient querying.
- Data Analysis

    - The ability to generate insights, complex queries, and interactive dashboard/visualizations
- Project Management
    - The ability to create sprint planning, have backlog management and tasks tracking.
- Communication
    - Required to have real-time communication and file-sharing.
- Documentation and Collaboration
    - Required to have centralized storage, real-time editing, and access to various documents.

Technology and Tools

Throughout our project, we have used various technology and tools to help us efficiently stay connected, collaborate, but also generate the data to support our user stories.

Technical Tools

- Tableau Software
    - Data visualizations and dashboards
- SQL Server
    - Data query and data management
- Excel
    - ETL process
- Canva
    - Deck creation for presentation

Project Management

- Jira
    - Task management, backlog management, and sprint planning.

Collaboration

- Discord
    - Real-time communication and collaboration
- Google Drive
    - Centralized documentation management with real-time collaboration and access

- Zoom
    - Presentation recording and collaboration

Process and Methodology

Project Management Approach

Agile Methodology

We utilized the Agile Methodology for our project because it promoted the flexibility and iterative progress that our team needed. We had the flexibility to organize our tasks into four sprints throughout the quarter that had defined goals and deliverables that fit into our modules for the Capstone class. With Agile, we also had the ability to be flexible due to changes that needed to be made via feedback, or if there were a scheduling conflict with our team.

Sprint Planning

We had a total of seven weeks to complete our project, due to this we were unable to do four 2-week sprints. For our last sprint – Sprint 3, we only had a cycle that lasted one week, compared to the three prior sprints.

In our four sprints, we had one main deliverable that we needed to accomplish, and that was the Group Assignments. The Group Assignments consisted of design documents (diagrams), prototype demo, SQL scripts, and updates from each team member reflecting on tasks completed and any blockers.

Sprint 0 (4/15-4/29)

- Outline Project objectives
- Grant all team members access to project in Jira
    - Ensure that instructor is granted access to project in Jira
- Build data models (using Visio or a similar application)

Sprint 1 (4/29-5/13)

- Import raw data into SQL
    - Clean data within SQL in preparation for further transformation
        - Check for errors, make sure all viable information is accurate and free of null values and errors.
- Create database based off of models created in Sprint 1
- Move cleaned data into the created database
    - Ensure that all team members have access to the new database

Sprint 2 (5/13-5/27)

- Create Dashboard to display map charts/geographic information
    - Add heatmaps of SNAP benefits to dashboard
- Implement dashboard filtering and sorting functions to allow users to filter by relevant information (distance to store, household income, etc.)
- Create deck presentation
- 1st dry-run recording for presentation

Sprint 4 (5/27-6/3)

- Add visuals, notes, and other supplementary materials to the dashboard that can be easily understood by the target audience.
- Revise and complete deck for presentation
- 2nd dry-run recording for presentation

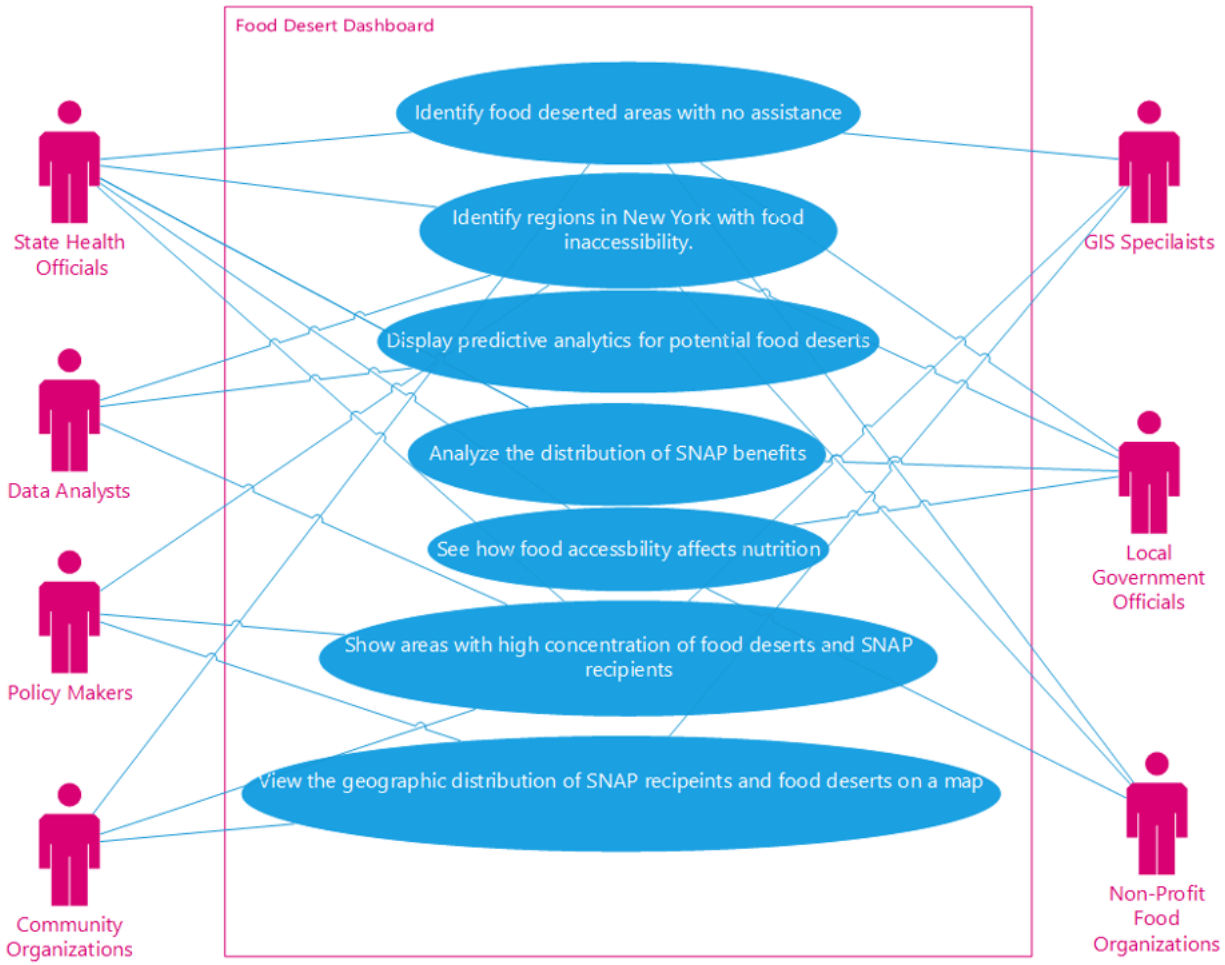
User Stories

- **User Story for State Health Officials:** As a state health official, I want to identify regions in New York where access to grocery stores is limited, so that I can prioritize these areas for interventions and support.
- **User Story for Data Analysts**: As a data analyst working on public health issues, I want to analyze the distribution of SNAP benefits across different neighborhoods, so that I can understand the correlation between SNAP benefit distribution and the availability of grocery stores.
- **User Story for Policy Makers:** As a policy maker, I want to view a dashboard that shows both food deserts and areas with high concentrations of SNAP recipients, so that I can make informed decisions on where to allocate resources like mobile food markets or subsidies for local groceries.

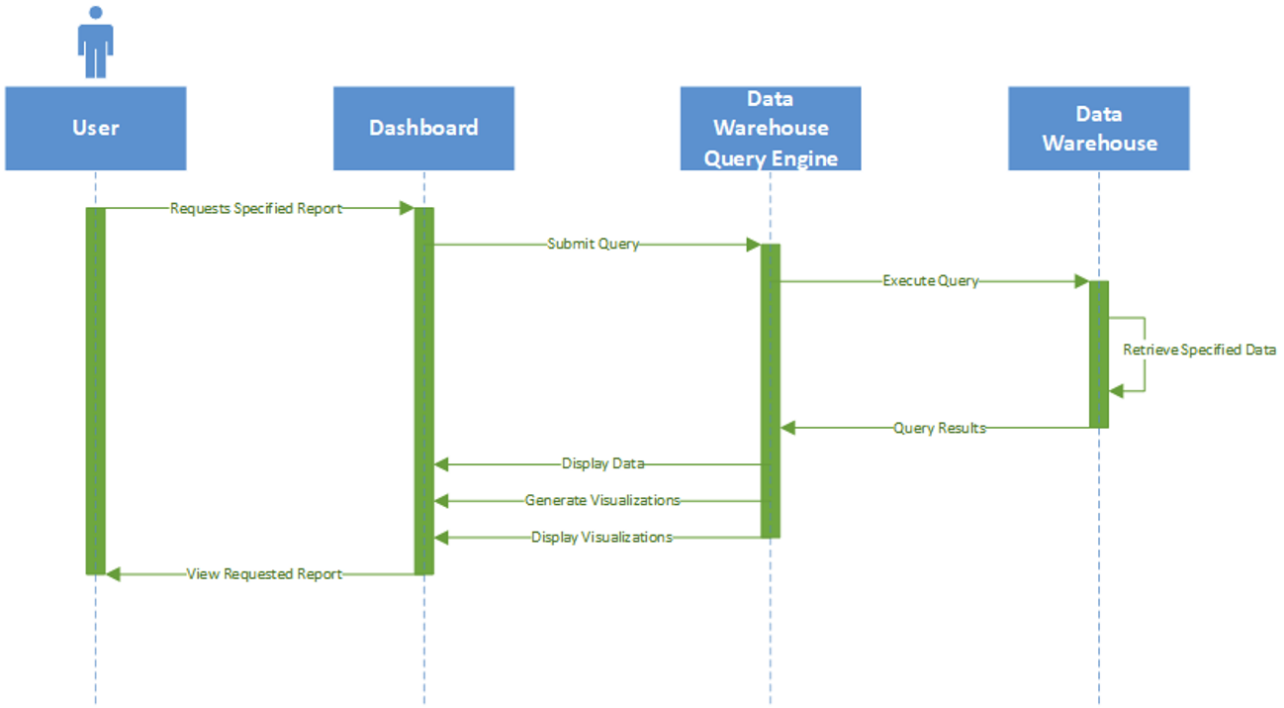
- **User Story for Community Organizations:** As a community organization leader, I want to see data on how food accessibility impacts nutritional outcomes in communities, so that I can tailor our programs to better meet the needs of the communities we serve.
- **User Story for GIS Specialists:** As a GIS specialist, I want to create a map overlaying food deserts with SNAP recipient housing, so that stakeholders can visually assess the geographic distribution and scale of these overlaps.
- **User Story for Local Government Officials:** As a local government official in New York, I want to have access to predictive analytics about the potential expansion of food deserts, so that I can proactively plan urban development to prevent the growth of new food deserts.
- **User Story for Non-Profit Food Organizations:** As a representative of a non-profit focused on food security, I want to use analytics to identify food deserts that are not currently served by any food assistance programs, so that we can expand our outreach and service delivery to these areas.

Design

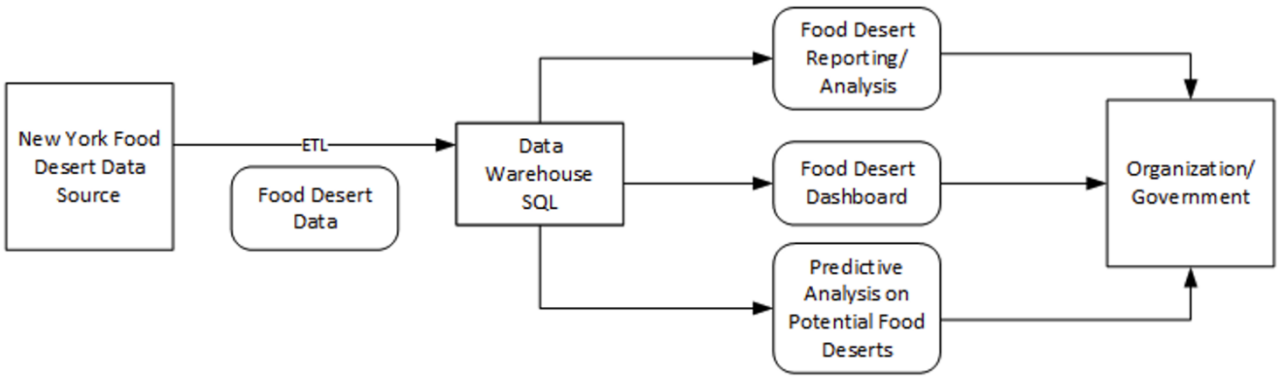
Use Case Diagram



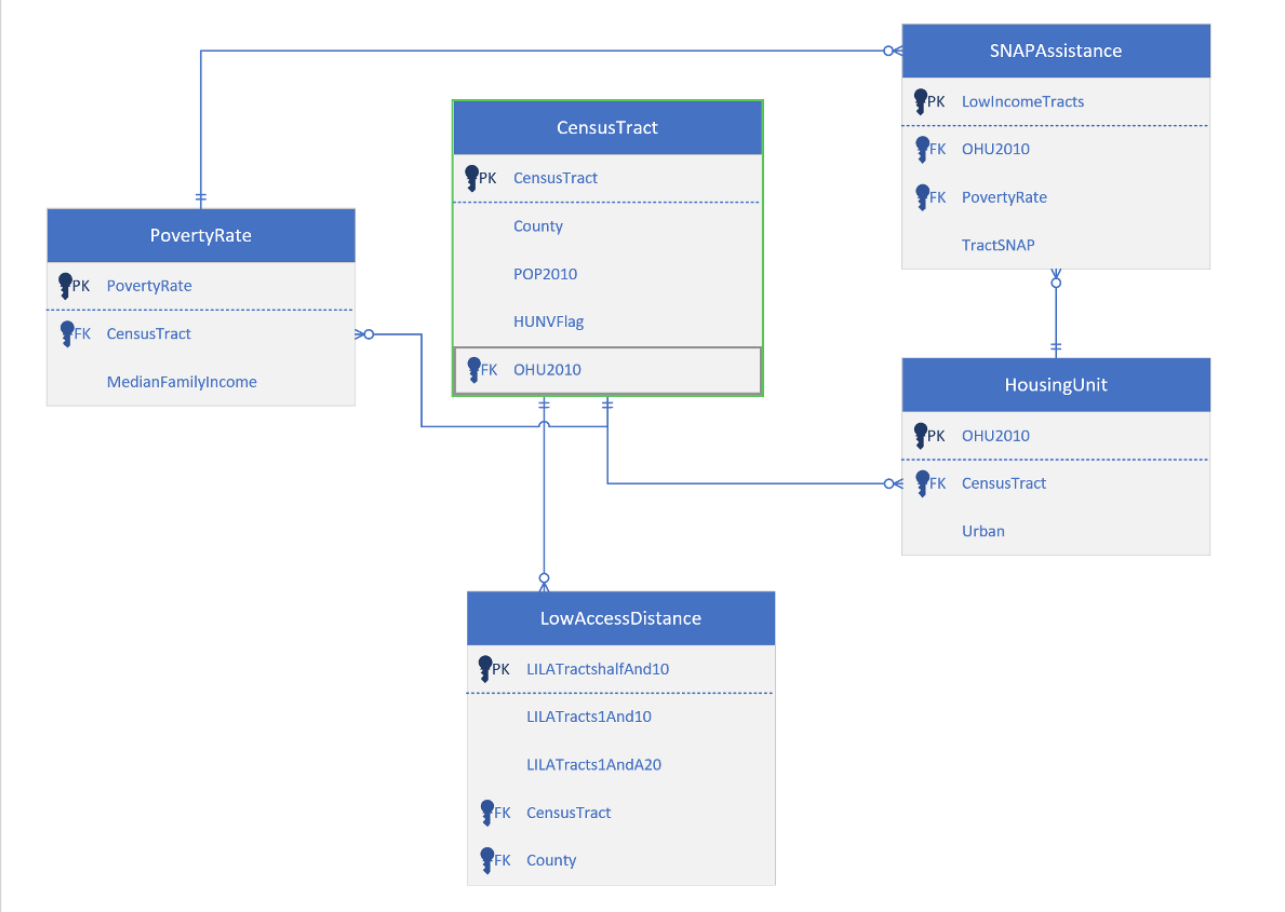
Sequence Diagram



Data Flow Diagram

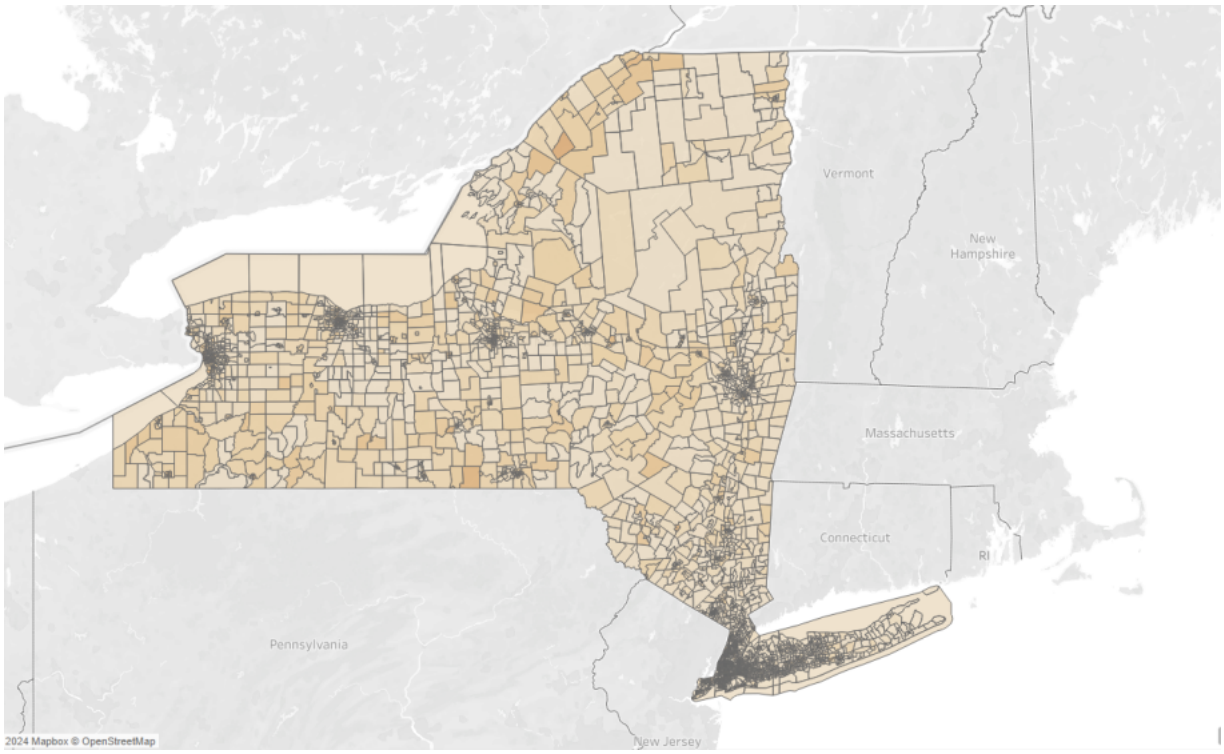


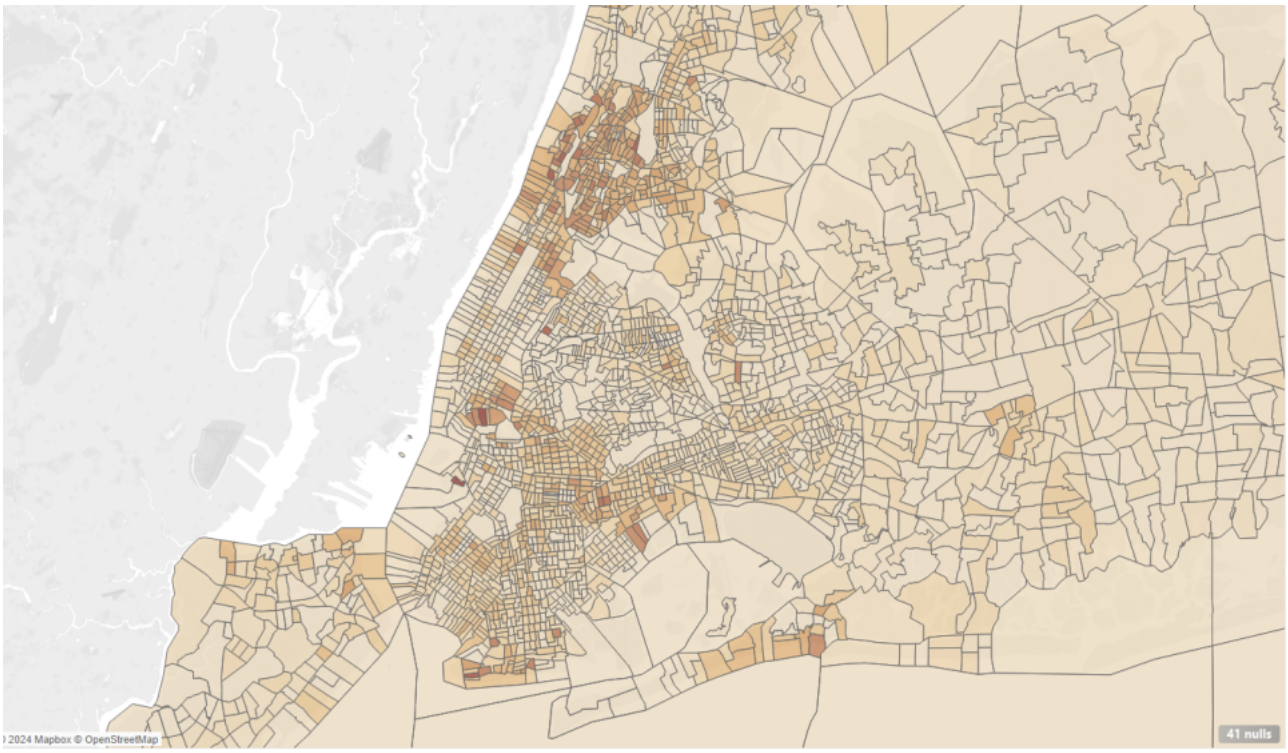
ER Diagram


SNAPAssistance
PK LowIncomeTracts
FK OHU2010
FK PovertyRate
TractSNAP
CensusTract
PK CensusTract
County
POP2010
HUNVFlag
FK OHU2010
PovertyRate
PK PovertyRate
FK CensusTract
MedianFamilyIncome
HousingUnit
PK OHU2010
FK CensusTract
Urban
LowAccessDistance
PK LILATractshalfAnd10
LILATracts1And10
LILATracts1AndA20
FK CensusTract
FK County

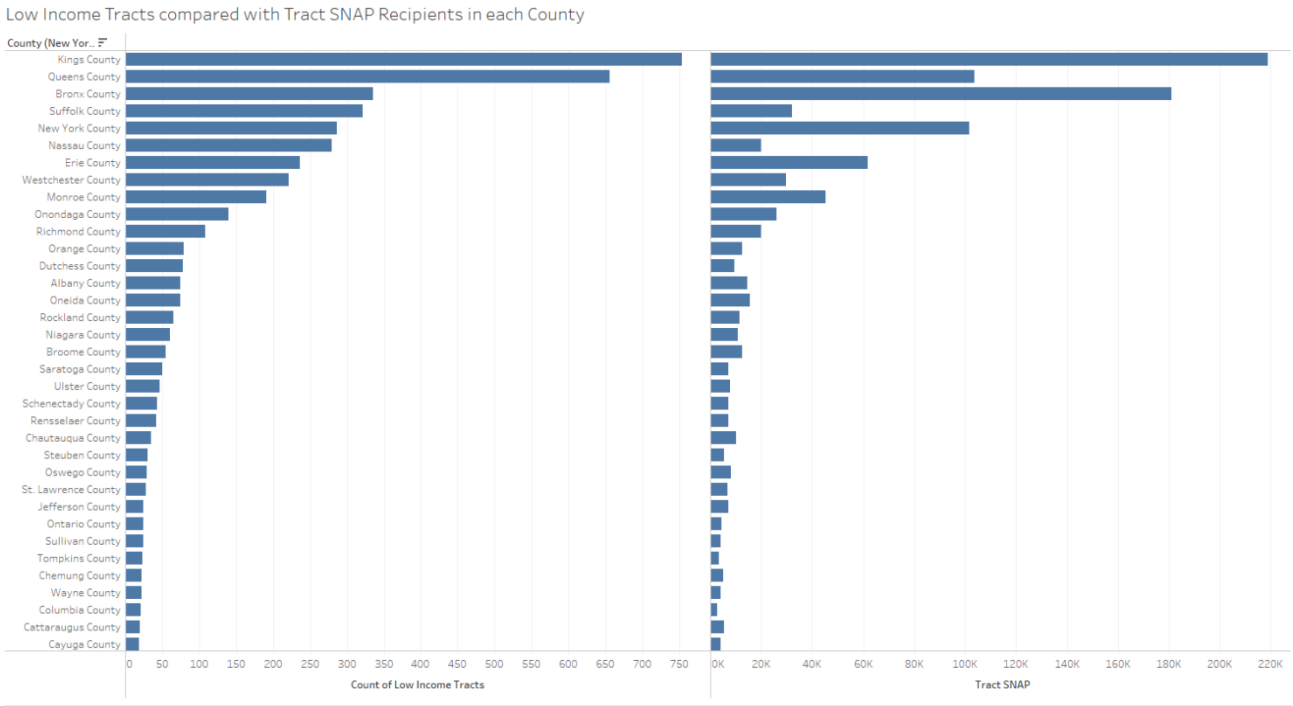
Sample Reports

SNAP Recipient Map





Low Income Tracts and Snap Households Per County



Conclusion

The completion of the food desert analysis project in New York marks a significant achievement in understanding and addressing food insecurity within the state. Over the course of seven weeks, our team systematically identified areas with limited access to fresh and healthy foods and analyzed the underlying demographic characteristics that contribute to food deserts.