Riverside Food System Map & Food Accessibility Analysis

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**Problem Statement**

American cities are striving to develop strong local food systems to:
- Increase fresh food accessibility
- Cut carbon emissions due to food transportation (Galzki et al, 2014)
- Promote competitive prices and a variety of nutritional foods to local residents

GIS technology is a powerful tool that can promote this cause in these ways:
- Identify low-hanging fruits such as food deserts
- Inform decision-makers and convincing them to support poor neighborhoods with low food access
- Engage food growers, consumers and agricultural stakeholders through web-based applications

**Study Area: City of Riverside, California**

The City of Riverside is ranked 12th in California with a population of 324,696 (2016) and a median income of $54,444. The city administration through the Agricultural Business Development supports community programs and initiatives that spur local food production and consumption.

- The food industry was ranked 3rd in 2016 for providing 11,282 jobs
- The city has six designated farmers' markets locations and approximately forty supermarkets
- Other sources include: farms, community gardens, roadside farm stands, and grocery stores

**Methods**

**Project specifications:**
- Map food resources
- Investigate the city situation with regard to healthy food accessibility using spatial analysis
- Provide an interactive web tool to engage consumers, food growers and policy makers

**Technology:**
- ArcGIS API for JavaScript
- JavaScript
- HTML5
- ArcGIS for Desktop

**Workflow**

1. Data cleaning
2. Unpacking
3. Decoding
4. Network Analyst
5. Spatial Analyst
6. Food sources
7. Income data
8. Street network
9. Publishing Hosted Feature Services

**Solution**

Develop a repository of Riverside food resources, perform spatial analysis to identify food deserts and overall healthy food accessibility and avail all this information on a web-based application.

**ArcGIS Desktop**
- Data preparation
- File Geodatabase
- Spatial Analysis
- Publishing Feature Services

**ArcGIS Online**
- Hosted Feature Services
- ArcGIS REST API

**Browsers on user computer**

**Conclusions**

Project requirements were delivered to the client:
- Created an interactive web-based repository of food resources
- Communicated food accessibility analysis results to consumers, food growers and policy makers through the web application

**Findings:** 19% of City of Riverside population live in food deserts. Accuracy can be improved using other methods that incorporate more complex variables in the analysis, E.g., Food demand vs supply.

**Anticipated Impact:** Policy makers/donors have a tool for decision making to improve food access in food deserts.

**The Web App and Analysis Maps**

- Household Median Income equal or below $43,000
- 20% households below poverty level
- Household Median Income equal or below $43,000
- 33% population live more than 0.3 miles from a food source
- Food sources; farmers markets, supermarkets, groceries, food pantries, and farm stands

**Web Mapping Riverside Food Resources**
- Visualize food resources in an interactive web tool
- Provide access to food information such as address, contact, website links, foods stocked and working hours
- Show overall spatial distribution of local food sources in the City of Riverside

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