

Visual Analytics to Identify Food Insecure Areas in West Michigan

Stephen Borders, PhD, MSHP

Blake Ferris

Mary Jo Beeby

School of Public and Nonprofit Administration



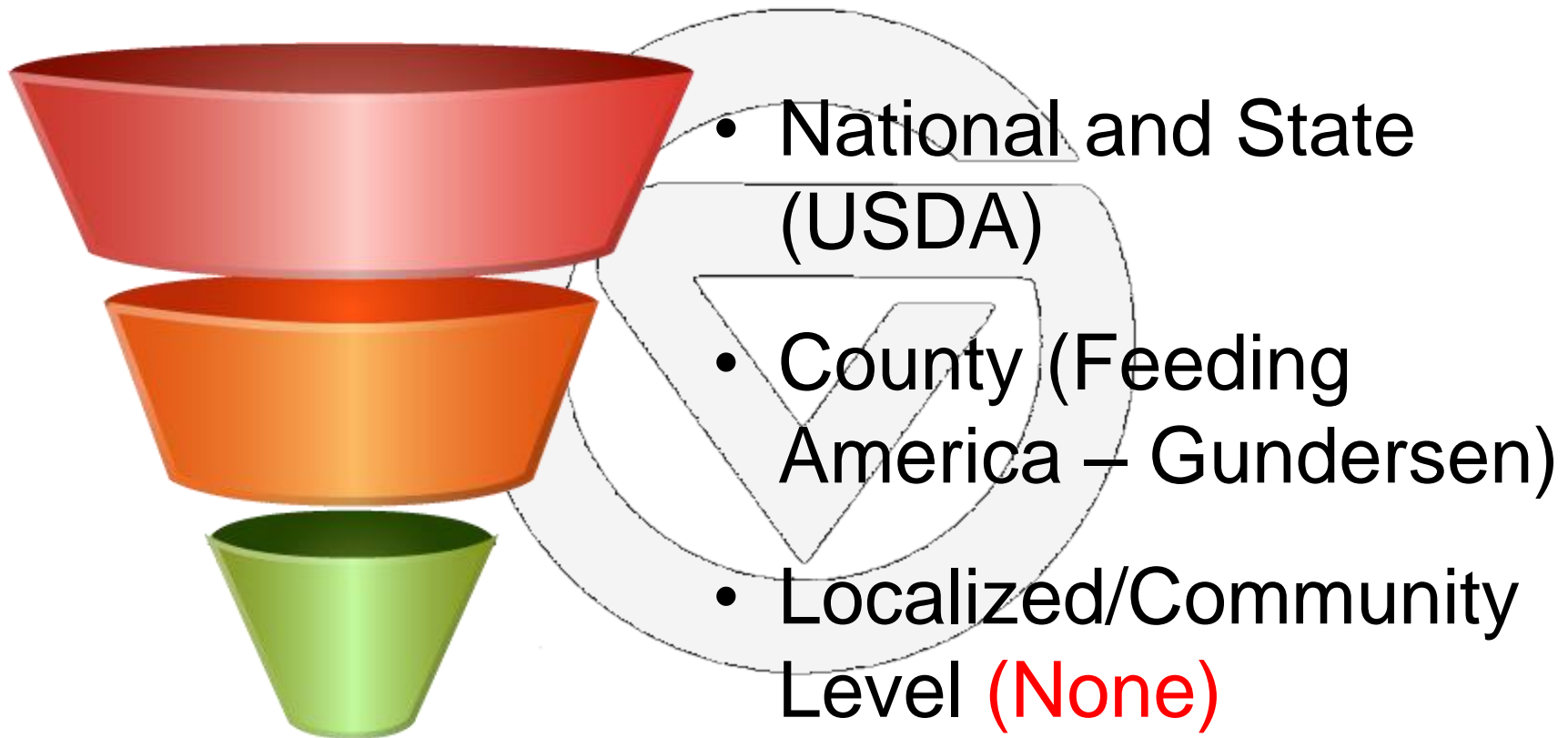
Big Picture

- Visualize the problem of food insecurity
 - Feeding America West Michigan
- Low cost, high impact way to conduct community needs assessments
 - Targeted intervention/Grant Writing
- Replicable
 - Use publicly available data (ACS)
 - Methodology is not complex
- Data Reduction/Dimension Reduction
 - Useful to a wide variety of constituencies

Food Insecurity

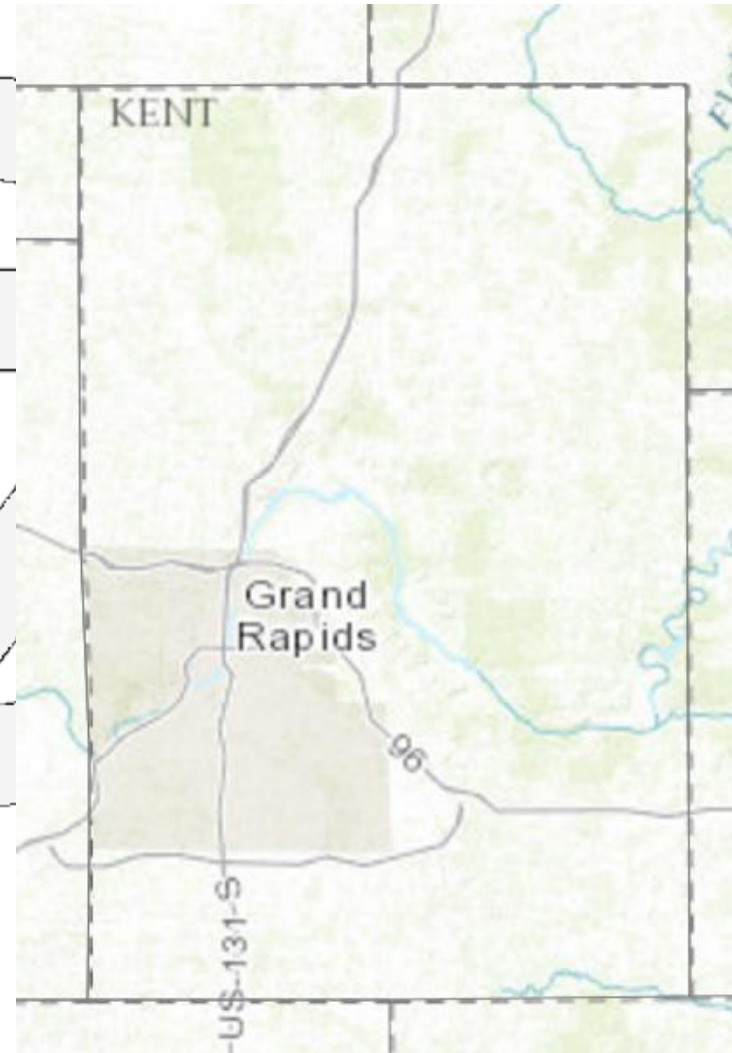
- “Access by all people at all times to enough food for an active, healthy life” (USDA)
- Nationally, about 14% or 17.4 million households were food insecure in 2014
 - Michigan 14.7%
- Who are the food insecure and where do they reside in West Michigan?

Food Insecurity Estimates

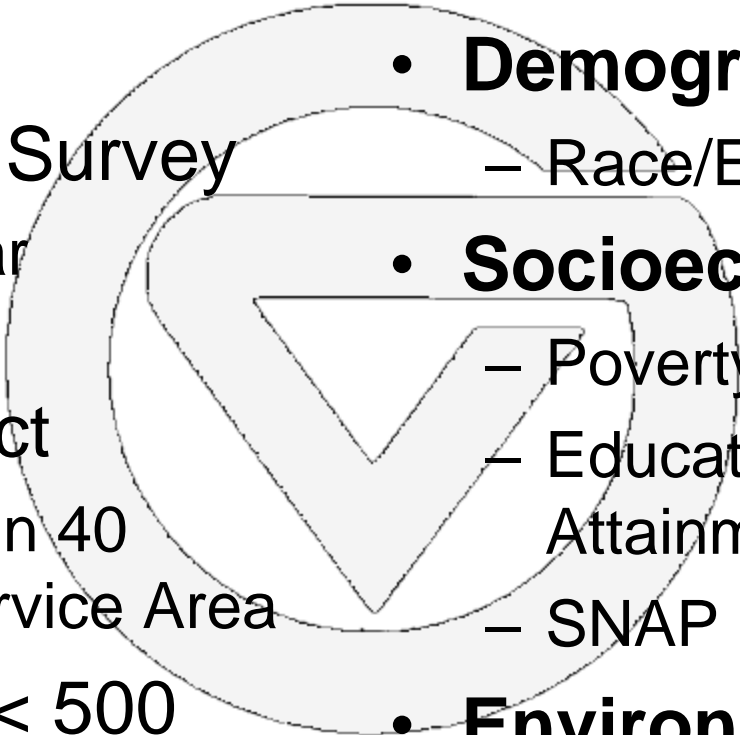


Who Are the Food Insecure?

- Kent County, MI
 - Home to Grand Rapids
 - 872 Square Miles
 - Pop 621,000
 - 77,500 are food insecure (estimated)

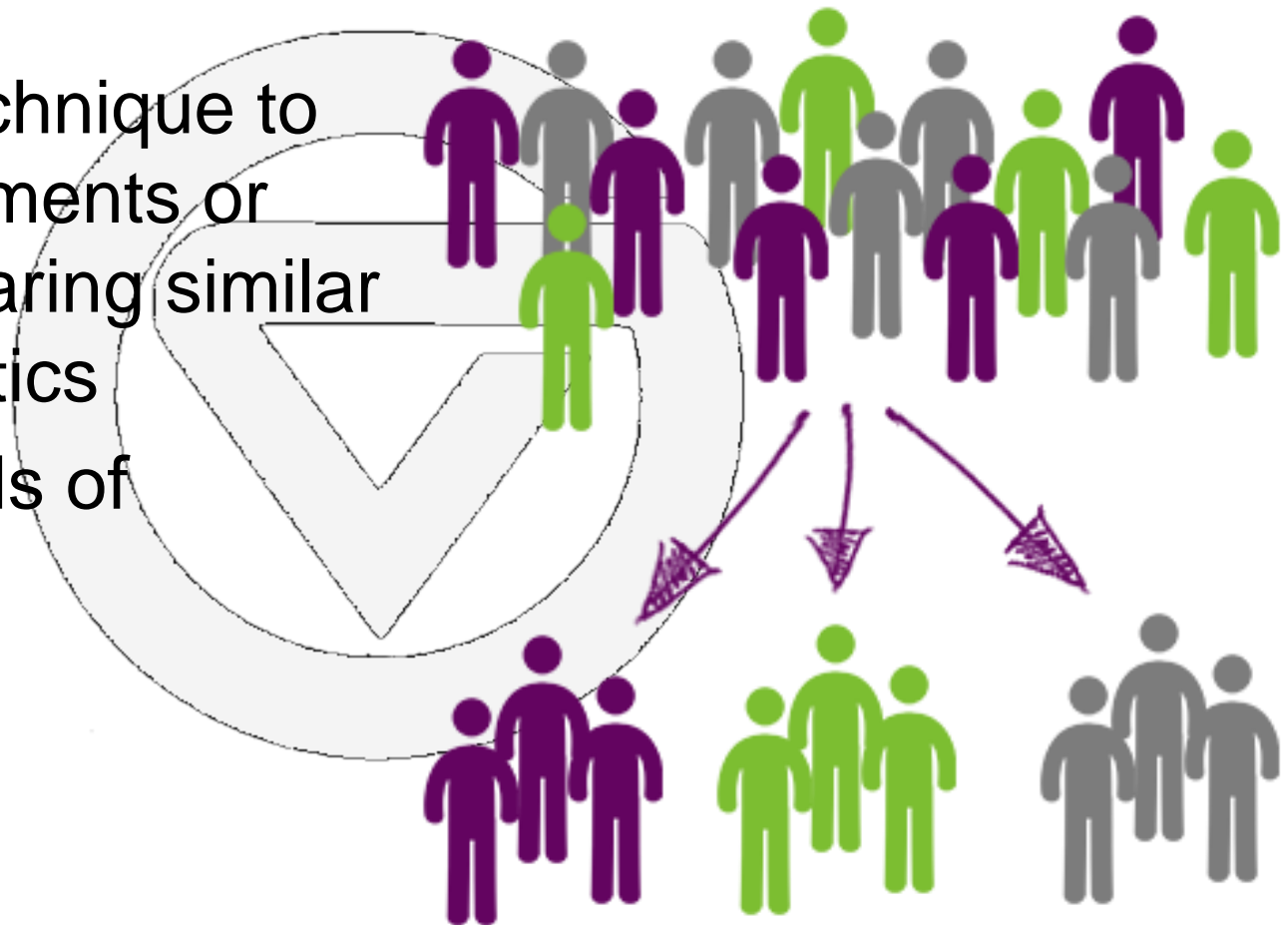


Indicators of Food Insecurity

- 
- American Community Survey
 - 2014 5 year estimates
 - Census Tract
 - 572 tracts in 40 County Service Area
 - Tracts with < 500 residents were eliminated from analysis
 - **Demographic**
 - Race/Ethnicity
 - **Socioeconomic**
 - Poverty
 - Educational Attainment
 - SNAP
 - **Environmental**
 - Urban/Rural
 - Lack of Transportation

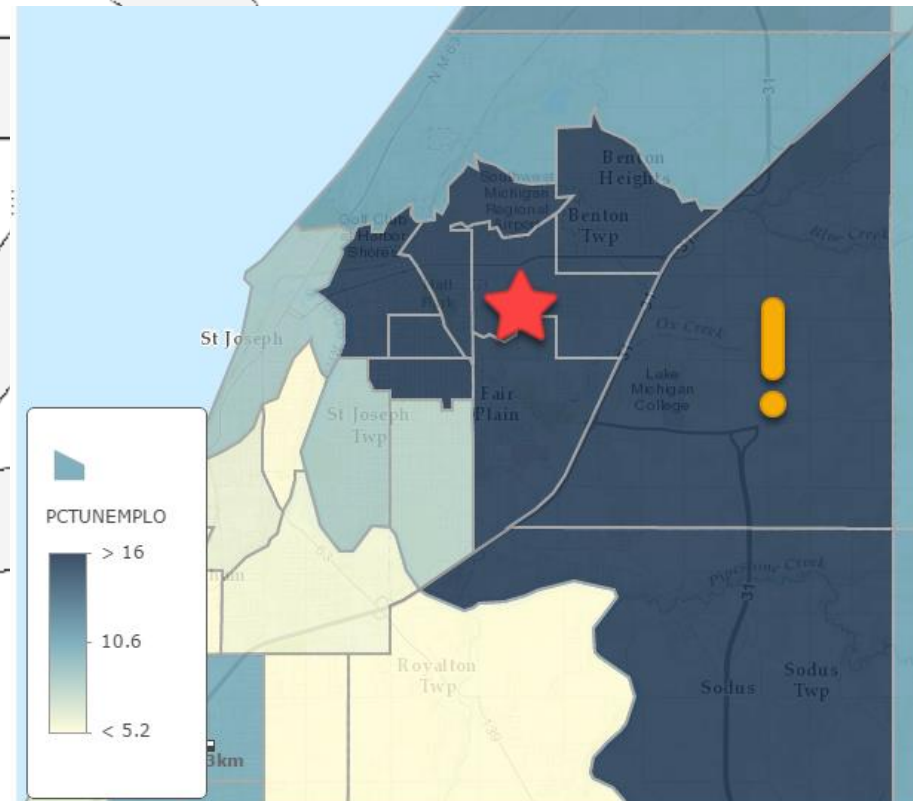
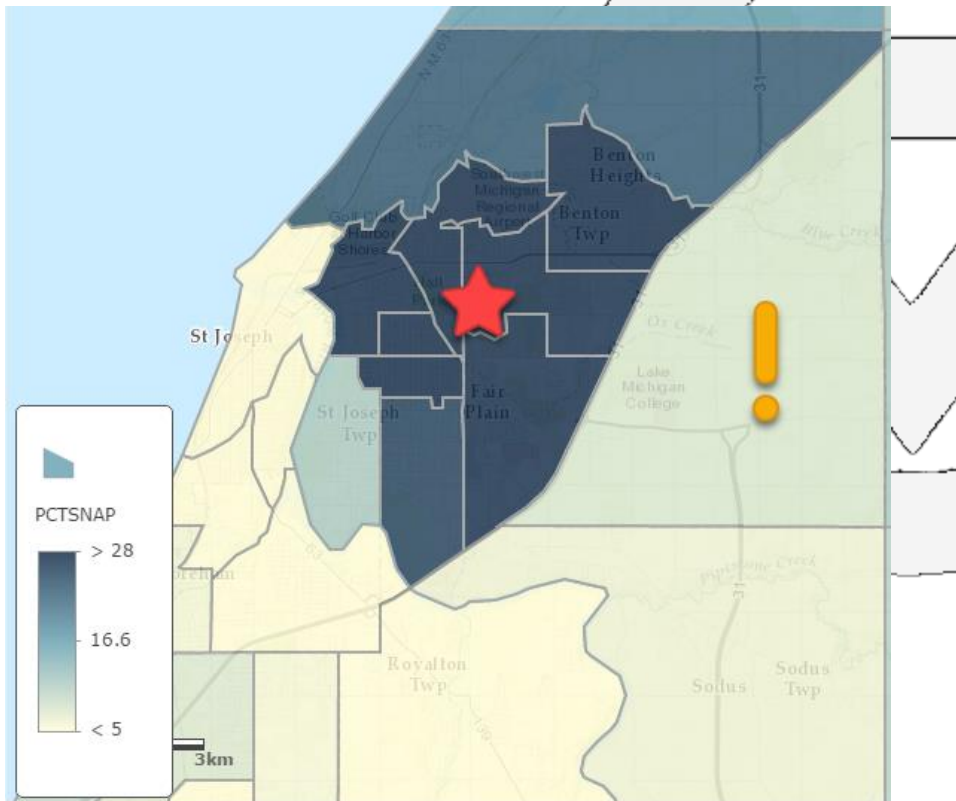
Cluster Analysis

- Profiling technique to isolate segments or clusters sharing similar characteristics
- Find “islands of similarity”



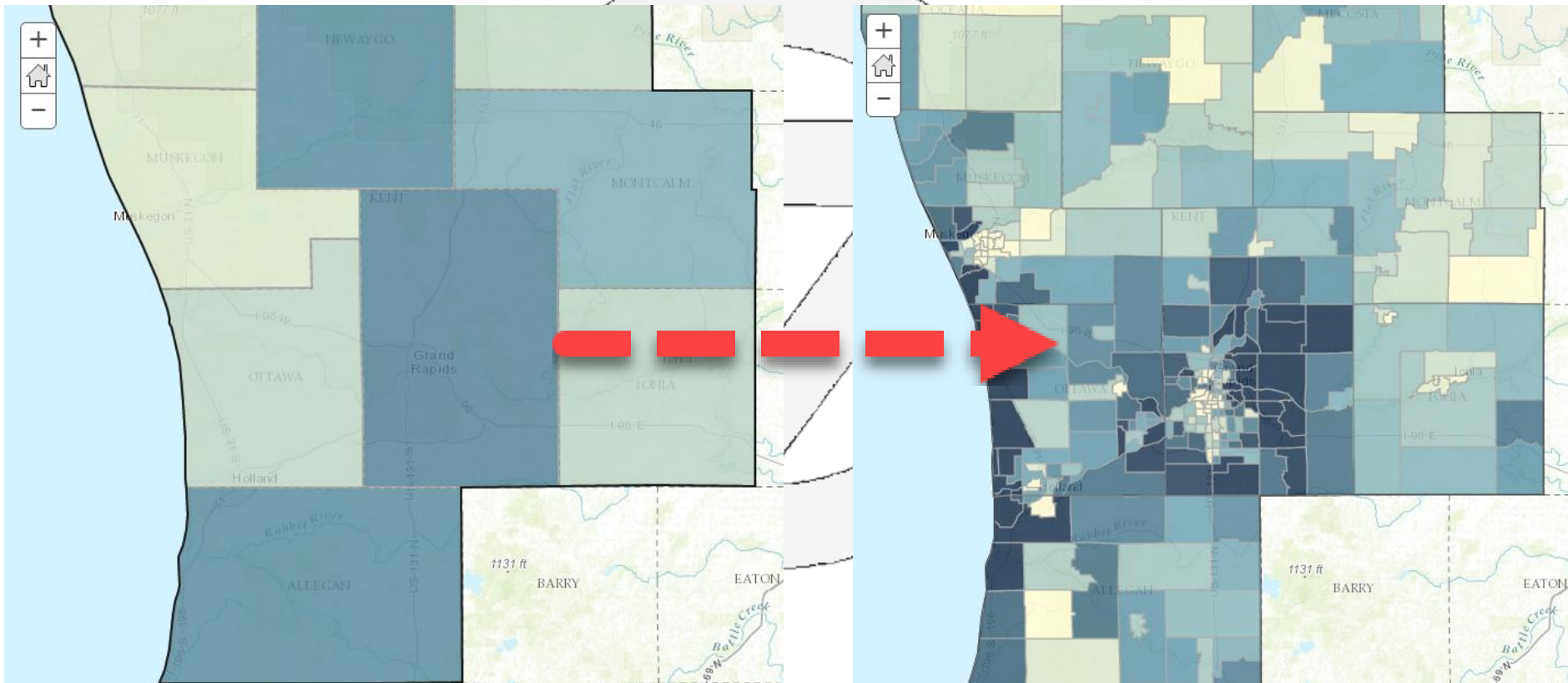
Why Cluster Analysis?

- SNAP Participation
- Unemployment



Why Cluster Analysis?

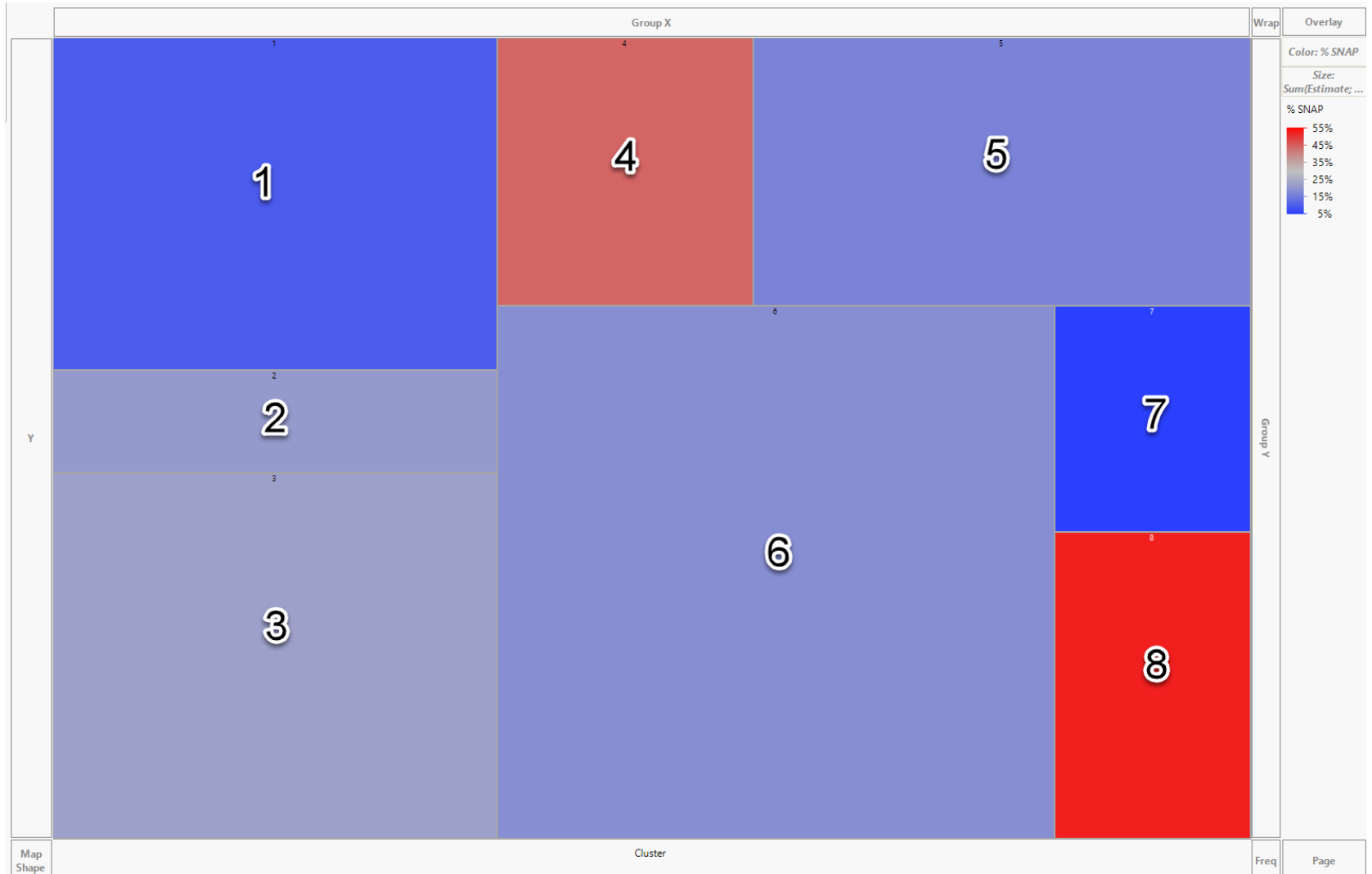
Move from Low to High Dimensionality



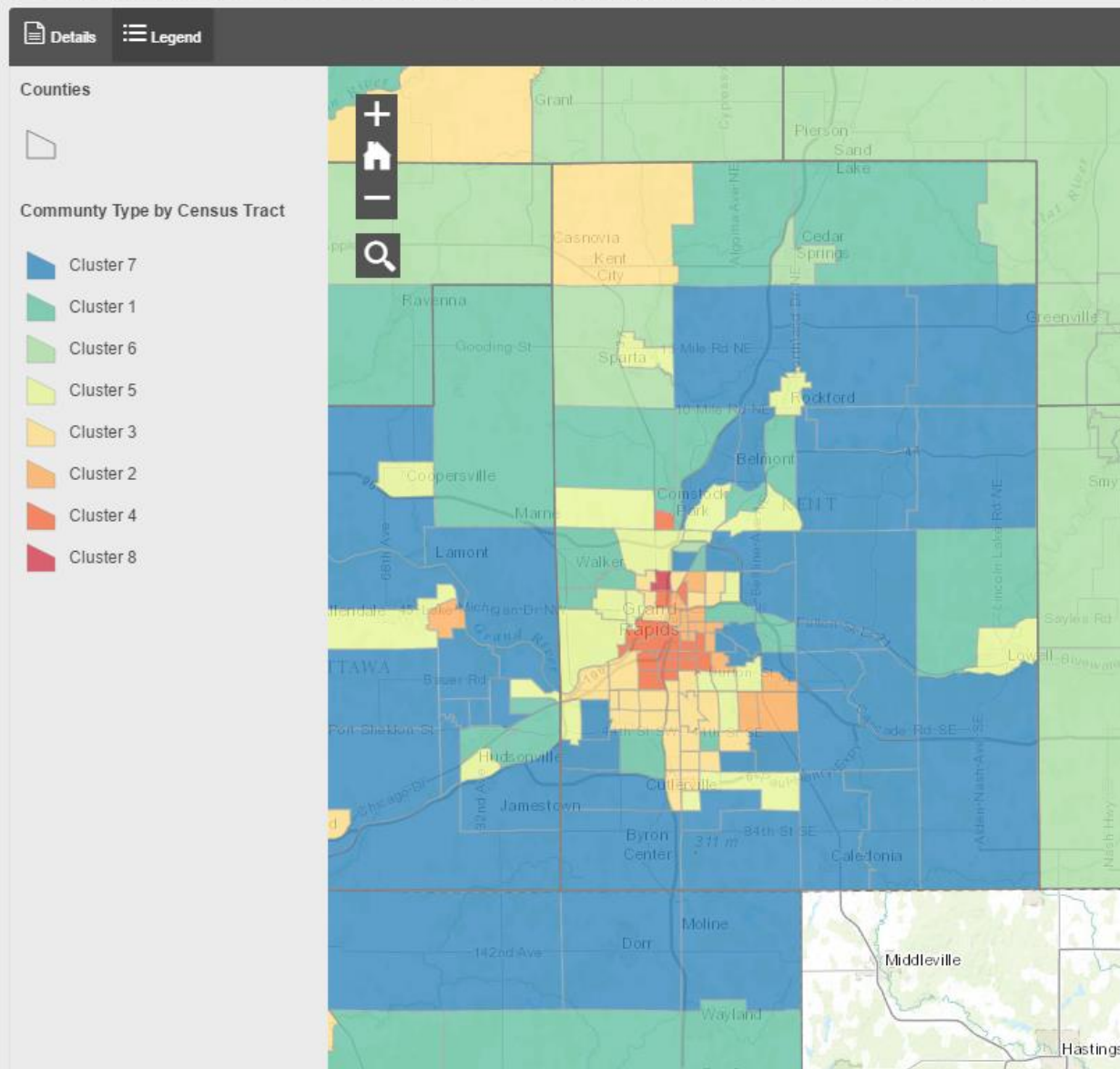
40 Counties

573 Census Tracts

Tree Map – SNAP by Cluster

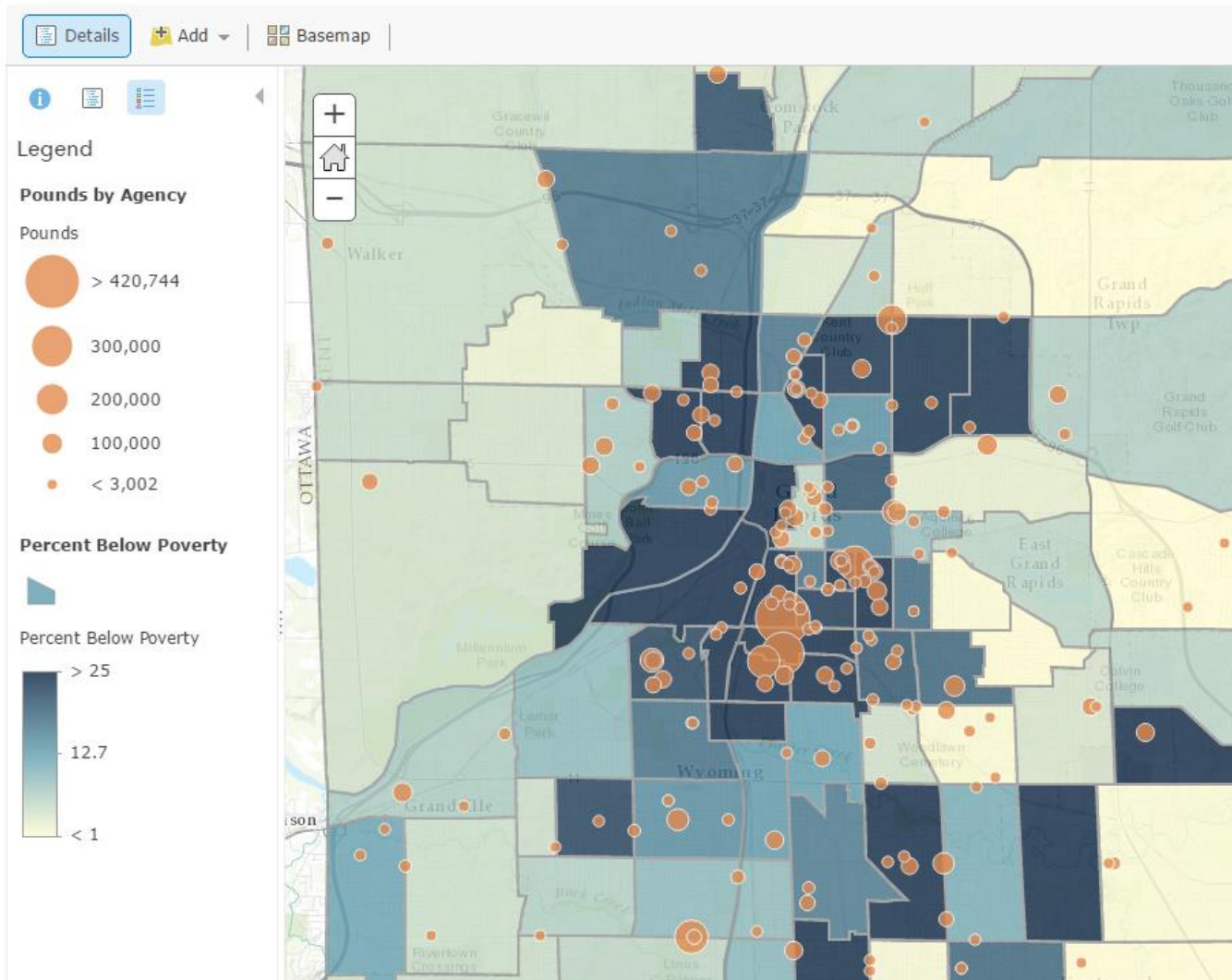


Feeding America West Michigan - Community Types by Census Tract



School of Public and Nonprofit Administration

ArcGIS ▾ FAWM - Pounds by Agency and Poverty by Census Tract: Kent County, MI



Limitations

- Our analysis works best in urban areas where there is greater heterogeneity among communities
- Using race/ethnicity in the model is problematic, especially in West Michigan
- What is most important predictor of food insecurity?
- Currency

Lessons Learned

- Food insecurity is complex
 - Need to think about more advanced analytical techniques
- Data reduction simplifies the message
- ACS offers good proxy variables, even though they are not perfect
- Training Feeding America West Michigan on the ArcGIS Online system
 - No cost to ArcGIS Online

Questions

Stephen Borders

borderss@gvsu.edu

Blake Ferris

ferrisbl@mail.gvsu.edu

616-331-6569