Discovering Our Muncie Foodshed

Delaware County's Food Security Assessment

Authors
Unai Miguel Andres MURP, M.S.
Emily Hart, M.S.
Elaine Vidal, M.A.
Sara Niccum, MA
Samantha Grover, M.S.
Joshua Gruver, Ph.D

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Background

Decades of economic decline have forever changed "Middletown America." Once considered the quintessential American small city, Muncie and its surrounding Delaware County are currently plagued with the 2nd highest poverty levels of any county in the state of Indiana (adults: 23%; children: 32%) and widespread food insecurity (adults: 17%; children: 25%). Seventy-five percent of the children in Muncie Community Schools qualify for free or reduced lunch.

The World Health Organization defines food security as a standard in which all members of a given population "have access to sufficient, safe, nutritious food to maintain a healthy and active life" (World Health Organization, 2013). Muncie and Delaware County suffer from demonstrated food insecurity based on a combination of three factors: poverty, lack of access to grocery stores, and lack of transportation.

Despite widespread food insecurity, small farmers of edible crops in Delaware County struggle to find markets for their produce. Agricultural support programs (e.g. Farm Bill) have tended to favor large-scale farms and promote dependency on a few products typically associated with large-scale commodity agriculture. Nationally, farms considered to be beginning farms constituted 25% of all farms in 2012, compared to just 14% in Delaware County (down from 20% in 2007) showing a negative trend among small and beginning farms in Delaware County compared to the national average. A closer look reveals that Delaware County lost 9% of small farms and had 33% fewer beginning farmers from 2007 to 2012 (USDA, 2012a), signaling an immediate need for economic intervention and community mobilization toward "growing" more farmers and nurturing a healthier, more resilient local food system.

Part of the strategy for developing a healthier food system at a regional scale is to provide the appropriate infrastructure and framework for growing, aggregating, and distributing food locally. Strategically placing Food Hubs around Indiana will serve to coordinate small-scale food producers, aggregate their food products within a given area, and efficiently distribute these food products to citizens, businesses, and institutions while also ensuring food safety.

"Food practitioners must be more closely networked with each other, to improve coordination across food initiatives, and to make sure that practice is as efficient as possible…stronger local distribution networks, local aggregation facilities, and processing plants for produce are critical; several such initiatives are underway across the state, which require greater investment. Others must also be created." (Meter, 2012)

The Indiana State Department of Agriculture "Food Hubs Feasibility Study" of 2015, conducted by Thomas P. Miller and Associates, corroborated Meter's suggestion. Muncie was identified as a suitable location for a Food Hub, citing the area's "many active producers," both in traditional and alternative/urban agricultural settings, as well as the presence of Ball State University as a resource for knowledge, funding, and a customer base.

Toward this, in January 2015 the Ball State Foundation and Ball Brothers Foundation committed funding to three Ball State University faculty members (PI-Gruver; Co-PIs-Truex and Eflin) to develop a plan that would address these concerns. The top priority of the team was to ensure that the plan was community driven and focused on solutions that would address food insecurity and food system change.

The first step toward these goals was to conduct a community food security assessment detailing regional food needs, barriers, opportunities, and next steps. Conducting the food security assessment allowed the team to develop key partnerships with groups and individuals within the community (e.g., food pantries, local growers, local businesses, distributors, local government, growers, and ECI food insecure residents). The assessment also allowed the team to learn from community members about their needs and the solutions that they were willing to be part of to address these needs. MFHP used the USDA Food Security Assessment toolkit as jumping off point, but modified and expanded the toolkit based on Delaware County's particular situation.

This report highlights the methodology and the results of our assessment. These results have been communicated to the community through several town hall style meetings and two annual local food summits that the MFHP, along with several other key partners hosted (i.e., Purdue Extension, Edible Muncie, and Ball State's Office of Community Engagement).

This is a living document. It is not meant as an official statement on the status of food and agriculture in Muncie and ECI, but is more akin to a snapshot in the "food-life" of a community. The Muncie Food Hub Partnership and our current and future collaborators will continue to add to and update this assessment through time. In the meantime, we hope it serves as a record of where we are now and hopefully proves useful to those wanting to learn about ECIs food and ag system. If anything, the information herein can potentially serve as a tool to leverage funding and other kinds of support from federal, state, local, private organizations who work to alleviate food insecurity and create food systems that are more amenable to agriculture that is sustainable for people, the land, and all the living things the land supports.

Structure

The assessment is primarily composed of the following analyses along with supporting data and data representations (e.g., maps, graphs, tables): Sociodemographic context: Primarily uses American Community Survey data to look at the current conditions of the county from the whole county all the way to 2010 block group level. Some of the variables used on this analysis are the number of households receiving SNAP benefits, percentage of population under poverty level, and median household income.

- Sociodemographic: this analysis contextualizes the current population trends of the county, and overall community profile.

- Food Resources: this analysis explores the access to food resources including grocery stores, emergency food providers, local farms, and urban gardens. through analysis of the temporal and spatial distribution. The food store survey show the accessibility and affordability to healthy food items within the county's food stores in March 2015. Forty-four out of the county's 100 stores were surveyed and analyzed based on store type.

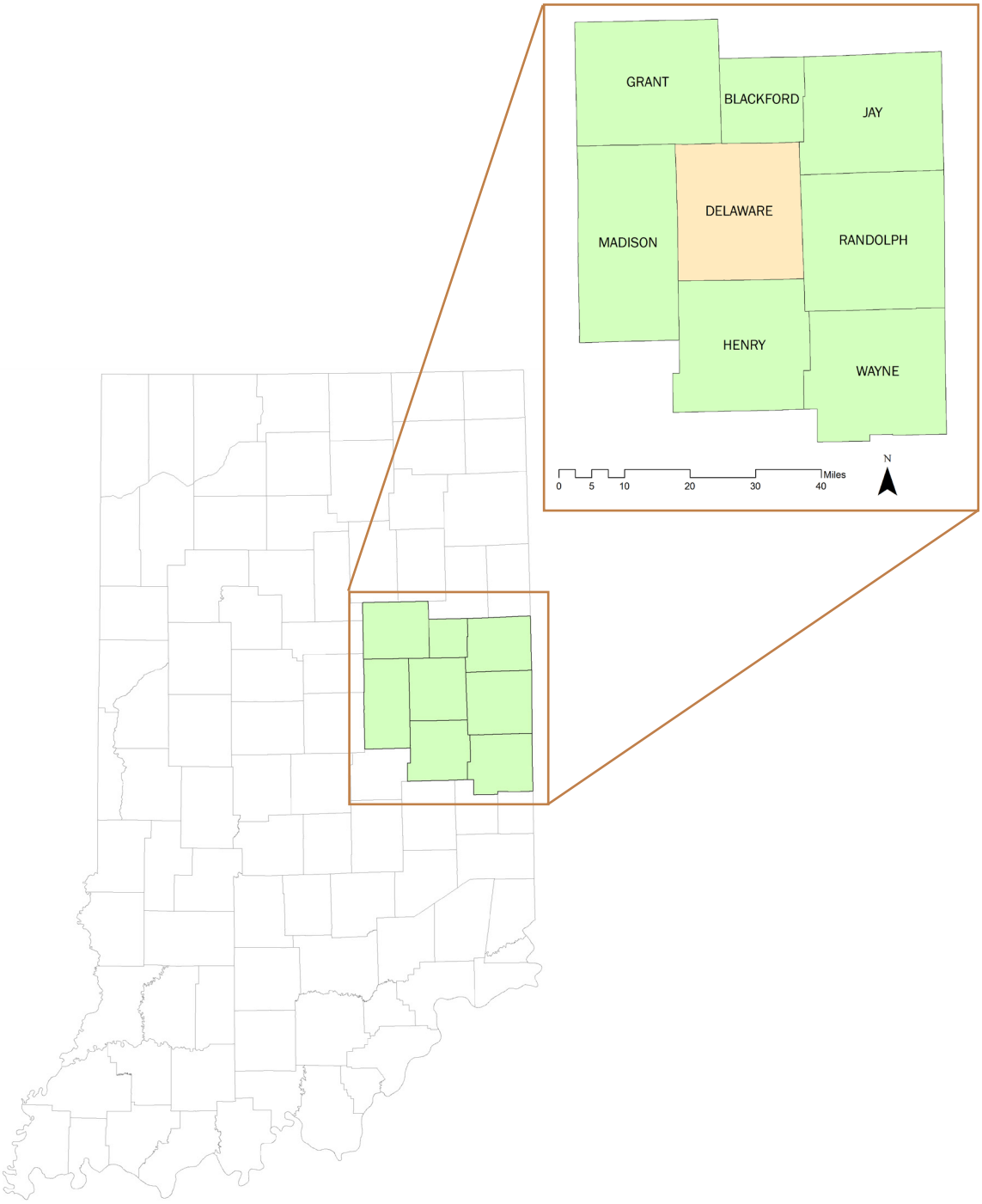
- Household Security: this analysis explores the challenges and barriers perceived by Muncie residents around food resource availability, accessibility, and utility. It was done by conducting focus group sessions and key informant interviews with a total of twenty-four study subjects. Eight household barriers and challenges were identified through this assessment.

- Producer Perspectives: this analysis explores the challenges and barriers perceived by East Central Indiana farmers around market access and business development resources. It was done by conducting key informant interviews with a total of thirty-three study subjects.

- Recommendations: this assessment identifies actionable steps that non-profits, institutions, and/or residents can take to improve access to healthy food within the county.

Assessment Area

Delaware County is located in the heart of East Central Indiana (ECI). It is of critical importance to note that Delaware County is the core of the region, not only because it houses the biggest city and economic hub, but because it is one of the only two counties recognized by all state agencies as being part of the ECI region. Despite existing differences in defining the boundaries of ECI among state agencies, for the purpose of this assessment the East Central Indiana refers to the counties shown below i.e. Delaware County, its immediatly adjacent counties, and Wayne county.



Who lives here?

Delaware County's Community Profile

Community Profile Summary

Delaware County and its demographics are heavily influenced by the existence of a large university (Ball State University) in the community. Therefore, it is important to note that while the overall county numbers (i.e. total county population) include the information found in the Census block groups that are encompassed by the university, the spatial analysis of the county excludes them, as these can be considered outliers. Unless otherwise cited, all demographic data for this section (Who Lives Here?) was retrieved from the US. Census Bureau 2016 American Community Survey 5-year Averages.

Delaware County has experienced a steady population decline since its population peaked in 1970. It can be argued that this has been a direct result of jobs that were lost when major auto industries closed their factories. Along with population decline, Muncie and Delaware County suffer from challenges common to midwestern rust-belt communities (i.e. high poverty rates, high unemployment, comparatively low median incomes).

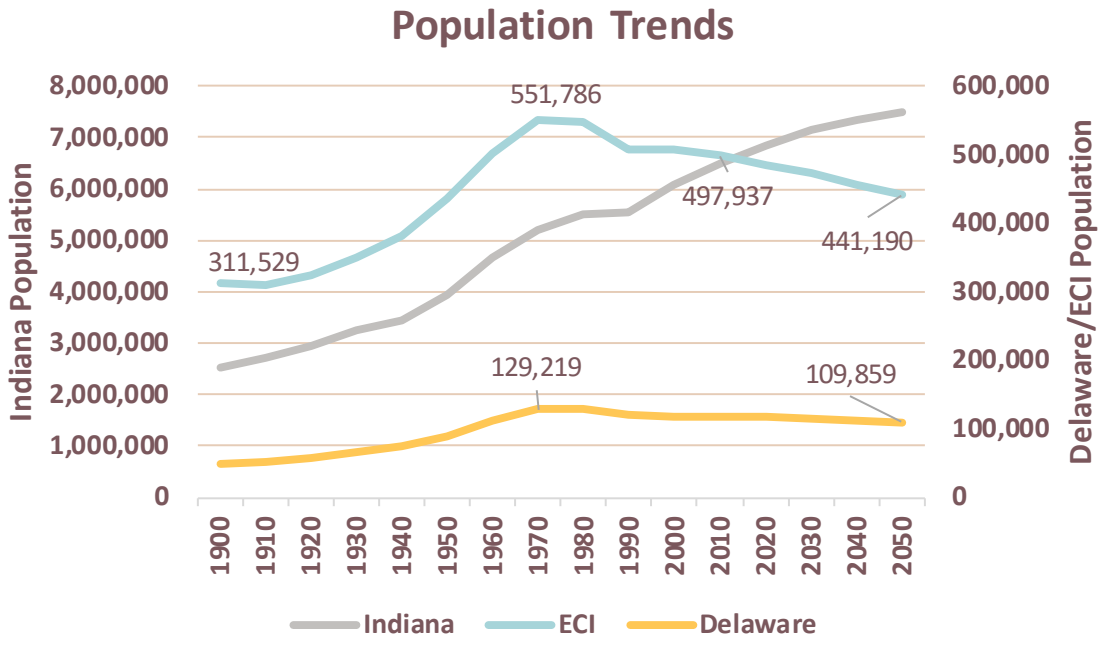
Another important population in the County is the group composed for all those between the age 15 and 35. This group is commonly referred to as millennials, who are culturally different and often hold different values than older generations. Millennials encompasses 1 in every 3 residents in the county, and it is safe to assume that most them are residing in the area in connection to Ball State University.

Delaware County's median household income is significantly less (22%) than the state median household income, and slightly less (5%) than the East Central Indiana (ECI) median household income. The County is primarily white (89%), however, minority populations can be found in several pockets within the county, mainly within City of Muncie.

Delaware County is home to many citizens living beneath the federal poverty threshold. Over 22%, or 1 in every 5 residents of Delaware County, live under the poverty threshold, which situates Delaware County as the county with the 2nd highest poverty rate in the state (US Census, 2016c). Over 16% (7,340) of Delaware County households receive Supplemental Nutrition Assistance Program (SNAP) benefits. Furthermore, 33% of Delaware County's households with children under the age of 18 are receiving SNAP benefits. This means that 1 in every 3 households with kids in the county is currently receiving SNAP benefits (US Census, 2016a).

Population Trends

The population in the State of Indiana has been continuously increasing since 1900. Conversely, while the overall population for ECI and Delaware County increased during the first half of the 20th century and part of the second half, peaking in the 1970s, it has declned dramatically since that time. While the State of Indiana has experienced a continued population increase, the ECI region lost 10% of its population between 1970 and 2010. While every county in ECI has lost population since 1970, 20% of the total loss comes from Delaware County, since it was and continues being the most populous county of ECI. The graph also shows that while the population of Indiana is projected to continue increasing the ECI and Delaware County will continue experiencing a population decrease.

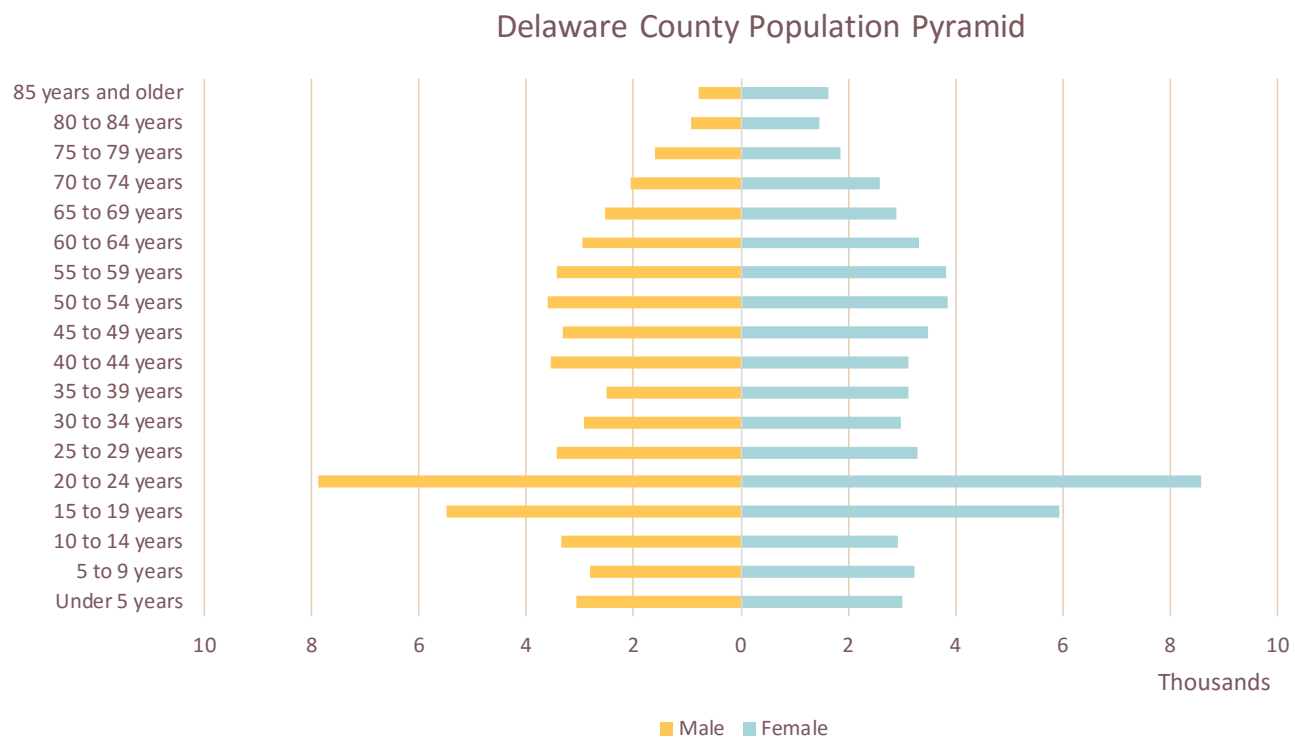


Population Estimate Source: 2010 Decenial Census
Population Projections Source: STATS Indiana

Population Pyramid

Delaware County's population pyramid has two peaks. The smallest of the peaks is around ages 45 to 65, which corresponds with the baby boomer generation. The biggest peak, encompassing over 35% of the total population is the group composed of those between the age 15 and 35. This group is commonly referred to as millennials. Millennialls account for 1 in every 3 residents in the county, and it is safe to assume that many are residing in the area as a result of attending to Ball State University.

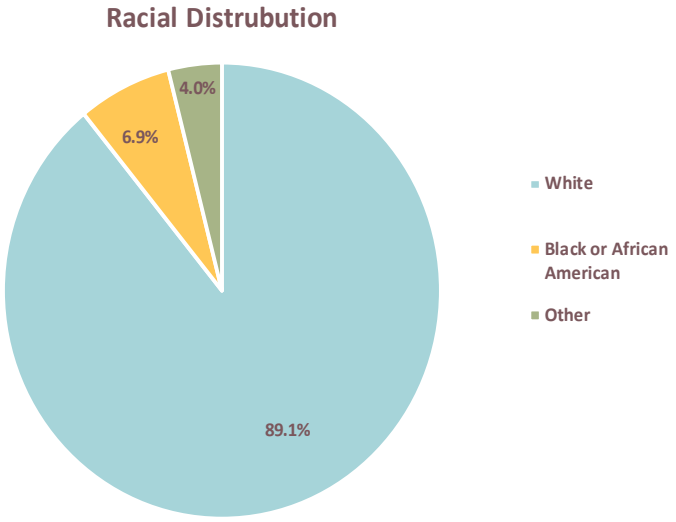
The millennial population can be further divided into two groups, young professionals, and students. We see a dramatic spike in population groups that encompass the typical student age groups, ranging from when when young adults enter college (17-19 years old), then complete their studies and graduate (20 - 24 years old). The young professional group ranging from 25 to 34 years old is less than half the student population. This suggests that although Muncie remains an educational destination for those attending college, upon graduation educated young professionals are compelled to seek careers elsewhere.



Source: 2011-2015 ACS 5 year estimates

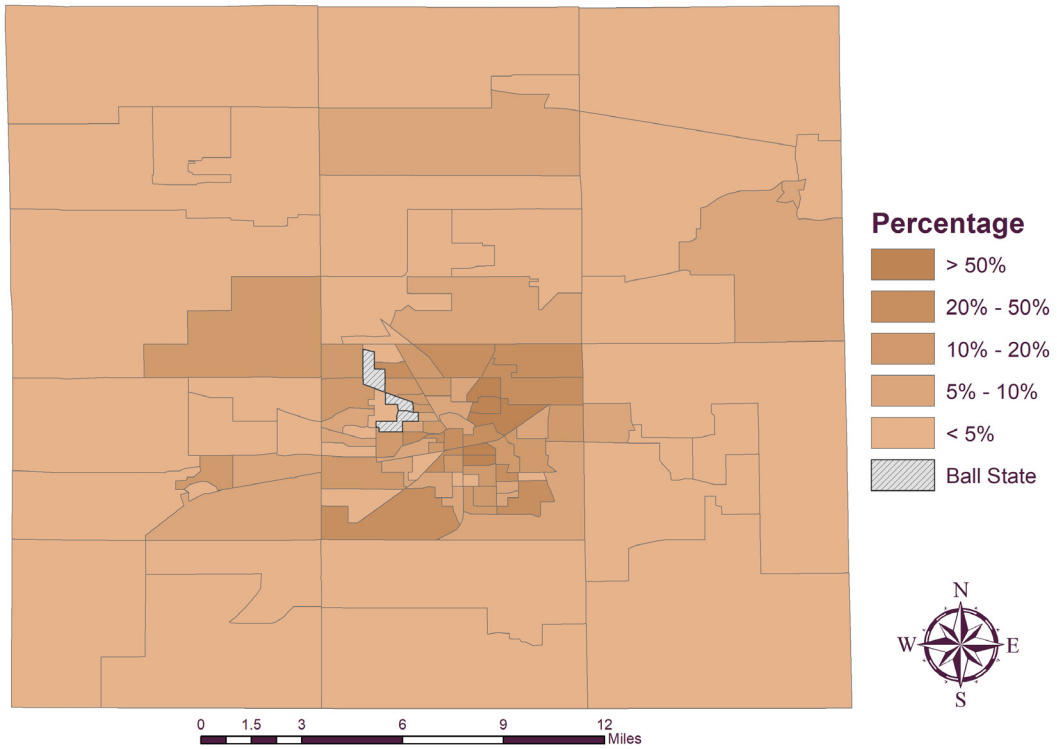
Racial Distribution

Delaware County is primarily white (89%), however, minority populations live in several pockets within the county, mainly within City of Muncie. The only two areas of the county where the non-white population is higher than the white population are the northeast side of Muncie, around the Whitely neighborhood, and on the southeast part of the city around the Industry neighborhood. Both of these neighborhoods are primarily black and have been historically black, as a result of the non-existence of a covenant on those areas.



Source: 2011-2015 ACS 5 year estimates

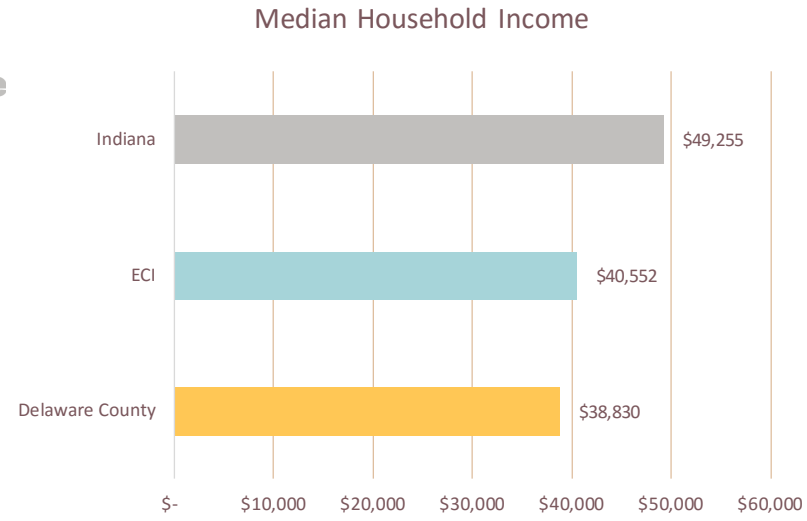
Neighborhood covenants that excluded minorities from living in certain communities within Muncie were common until the 1960s. This practice was thankfully abolished during the rise of the Civil Rights Movement. While the rest of the block groups in Muncie are primarily white there are some areas with high percentage of non-white people, such as the southeast and the northeast part of Muncie. However, there is a significant drop in the non-white population on the parts of the county that are outside of the City of Muncie, with percentages of non-white raging between 0-11%.



Percentage of Non-White People

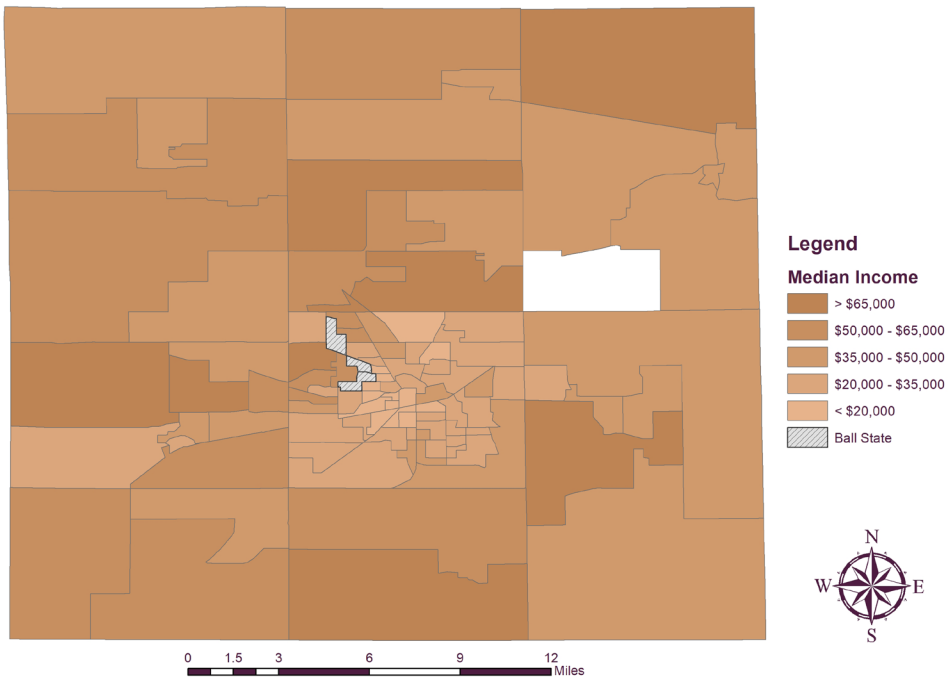
Median Household Income

Delaware County's median household income is significantly lower (22%) than the state median household income, and slightly lower (5%) than the East Central Indiana median household income. Delaware County's median household income is the 4th lowest in the entire state, just behind Blackford, Wayne, and Crawford counties, two of which are part of the East Central Indiana region. The county as a whole can be classified as a low income area since the county median household income is less than 80% of the state's income. The income gap between the County and state is over $10,400, which would be enough to feed a family of four for a whole year under the USDA low-cost food plan cost estimates.



Source: 2011-2015 ACS 5 year estimates

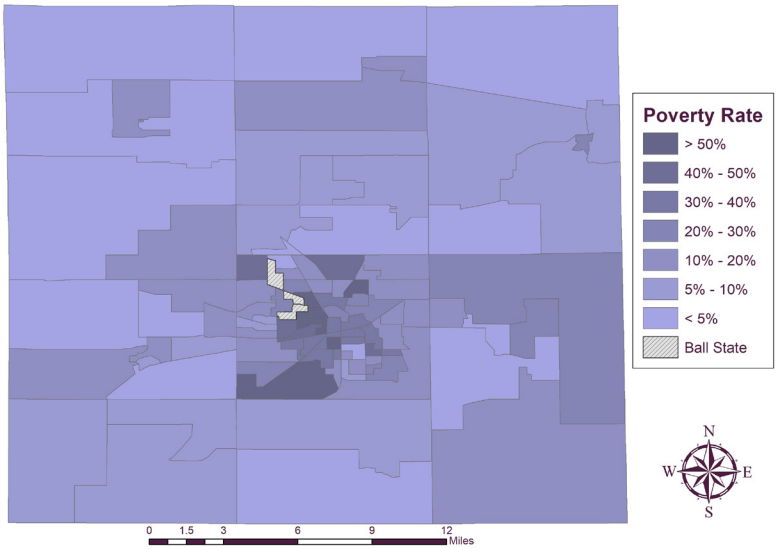
Huge income differences can be observed throughout the county, with block group median incomes ranging between $10,594 and $85,846. The majority of the City of Muncie, with the exception of a small area on the west side of town, has a median income lower than 80% than that of the state income. Furthermore, the area around downtown and the southwest part of the city has an income that is lower than half the state income. There are also some low income areas on the west side of the county right outside of Muncie and Yorktown.



Median Household Income

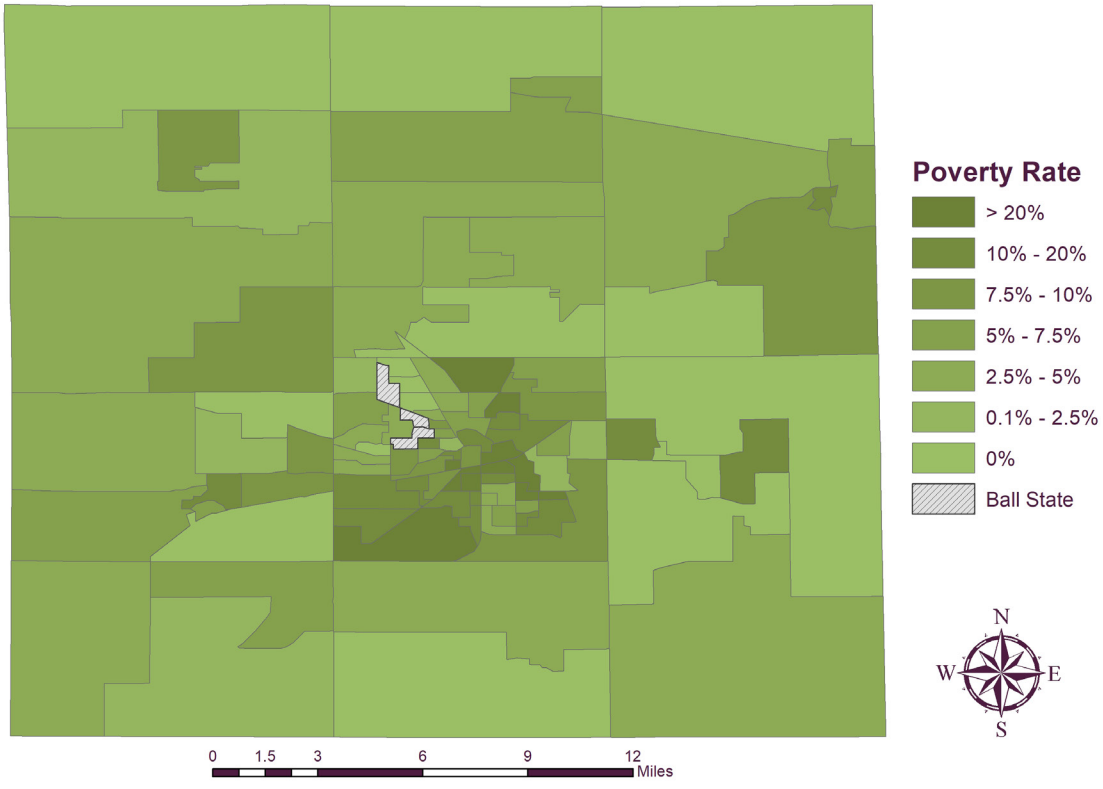
Poverty

Over 22%, or 1 in every 5 people, live under the poverty threshold, which situates Delaware County as the county with the 3rd highest poverty rate in the state.
Significant economic disparities can be observed throughout the county. The block groups with highest poverty rates can be found within the City of Muncie, in particular the areas directly east of Ball State, and on the north side of the city.



Household Poverty Rate

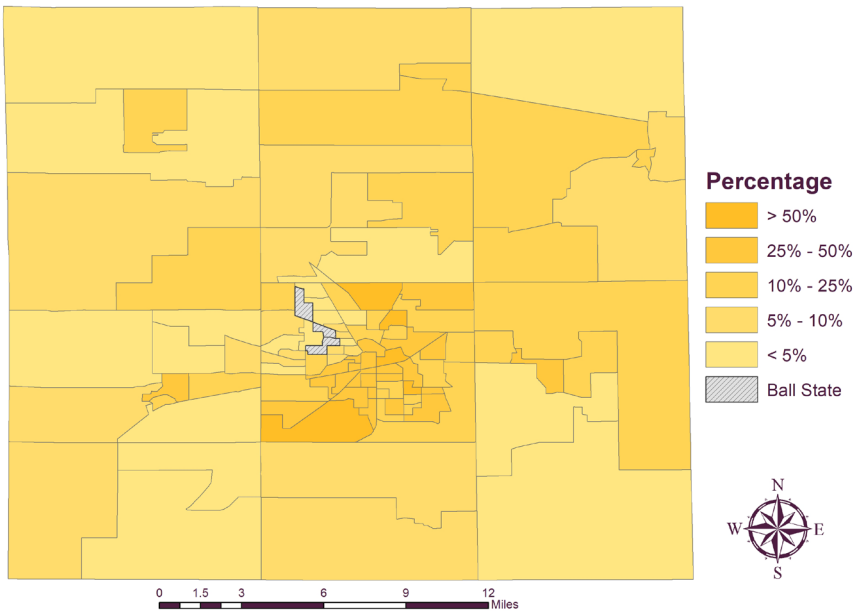
However, while some of the areas with higher poverty among family households are the same as the ones with overall household poverty (north side Muncie), there are multiple others that are not. For example, the downtown Muncie area has multiple locations where family household poverty is greater than 20%. There are also areas outside of the City of Muncie where family household poverty exceeds 20%, such as the block group corresponding to the towns of Albany and Selma.



Family households Poverty Rate

SNAP & Free/Reduce Price Meals

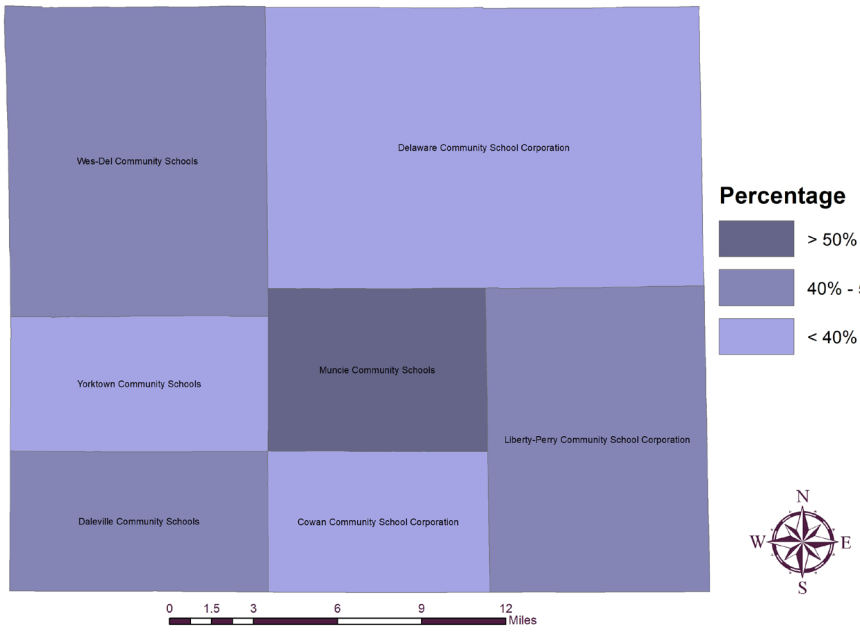
Over 16% (7,340) of Delaware County's households receive Food Stamps/SNAP. Furthermore, 33% (1 out of every 3) of Delaware County's households with children under the age of 18 receive SNAP benefits. This situates Delaware County as the county with the 3rd highest percentage of households with kids receiving SNAP benefits in the State of Indiana.



Percentage of Households Receiving SNAP

There is large variation in the percentage of household receiving SNAP throughout the county with the percentage ranging from 0-63.5% among block groups. More than half of the block groups within the City of Muncie have at least 25% of their households receiving SNAP. There are also two block groups outside of the city with 25% of the households receiving SNAP, one corresponding to the town of Selma, and the other corresponding to part of Yorktown.

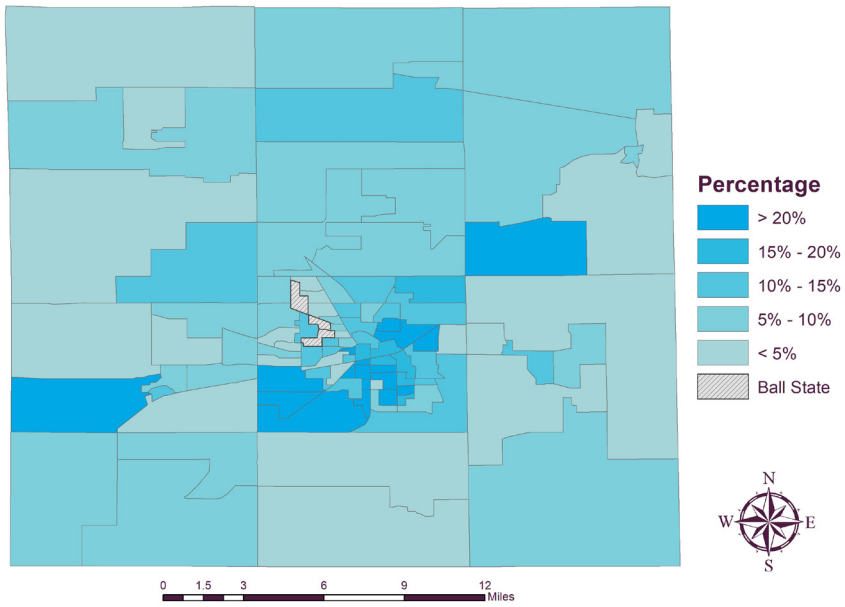
Also, it is important to note that there are 7,995 children attending public schools in Delaware County receiving free or reduced lunch. This is about 55% of the kids attending any of the 7 public school corporations in the county. Of the seven public school corporations, the one with the highest percentage of students receiving free or reduced price meals is Muncie Community Schools, at 75%. The smallest is Yorktown Community Schools, at 34%.



Percentage of Kids Receiving Free or Reduced Price Meals

Unemployment

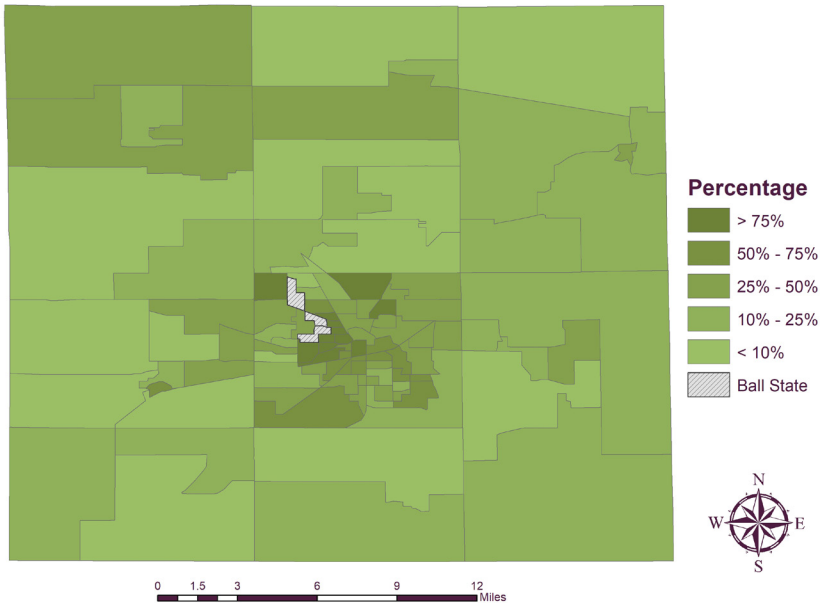
Delaware County's unemployment rate is 10.1%, which means that 1 in every 10 people in the labor force is unemployed. This is 2.3 points higher than the State's unemployment rate. The unemployment rate by block group in the county ranges between 0-35.5%. As with median household income and poverty rate, the areas primarily experiencing higher unemployment fall within the boundaries of the City of Muncie, however, there are two county areas where the unemployment rate is quite high (over 20%). One is just west from Yorktown, and the other one is on the north east side of Muncie.



Unemployment Rate

Housing Characteristics

The majority (87%) of the housing units in Delaware County are occupied. Almost two thirds (63%) of the occupied units are owner occupied. However, the majority of the block groups surrounding Ball State, and several on the southside of Muncie are primarily renter occupied areas (more than 50% of the units are rental units). It is safe to assume that the high percentage of renter occupied houses around Ball State are probably houses occupied by students and new university faculty/staff. On the other hand, the large percentage of renter occupied units on the southside of the city might by the result of people not being able to afford the purchase of a house, due to high unemployment rates and low income.



Percentage of Occupied Residences that are rental

What's here?

Delaware County's Food Resources

Food Resources

This section discussess the available food resources in Delaware County and data surrounding limitations to accessibility of those resources. For the purposes of this study, the following resources were reviewed:

- Retail Grocery Stores
- Emergency Food Assistance Providers
- Local Farms
- Urban Gardens

The goal was to provide a picture local food resources, and to identify challenges to accessing those resources and obtaining community food security. According the the USDA Food Security Assessment Toolkit:

Community food security is a relatively new concept with no universally accepted definition... communities may be considered food insecure if:

- There are inadaquate resources from which people can purchase foods.
- The available food purchasing resources are not accessible to all community members.
- The food available through the resources is not sufficient in quantity or in variety.
- The food available is not competitively priced and thus is not affordable to all households.
- There are inadaquate food assistance resources to help low-income people purchase foods at retail markets.
- There are no local food production resources.
- Locally produced food is not available to community members.
- There is no support for local food production resources.
- There is any significant household food insecurity within the community (Cohen et al, 2002).

Considering the above factors, community food security is best veiwed as a continuum along which communities can experience varying levels of food access. The following data will provide insight to the food resources of Muncie and Delaware County, with comparision to state and national benchmarks. In summary, when compared to other communities according to the above criteria, Muncie and Delaware County face significant food access barriers regarding retail grocery stores, accessiblity, healthy food availablity and variety, pricing, local food production, and infrastructure support for local food production. This study aims to shine a light on these food access issues and thereby inform future inititiatives toward community food security.

It is important to note that while emergency food providers offer invaluable services to those in need, and are explored in this assessment, they fall outside the definition of 'conventional' food resources described in the food security definitions preceding. Reliance on emergency food providers is by definition temporary, and is not considered by this assessment to be a sustainable food system solution for the many Delaware County households that suffer from food insecurity.

Box 1
What is Household Food Security?
Definitions From the Life Sciences Research Office

Food security—Access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum

- The ready availability of nutritionally adequate and safe foods.
- An assured ability to acquire acceptable foods in socially acceptable ways.

Food insecurity—Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

Hunger—The uneasy or painful sensation caused by a lack of food. The recurrent and involuntary lack of access to food.

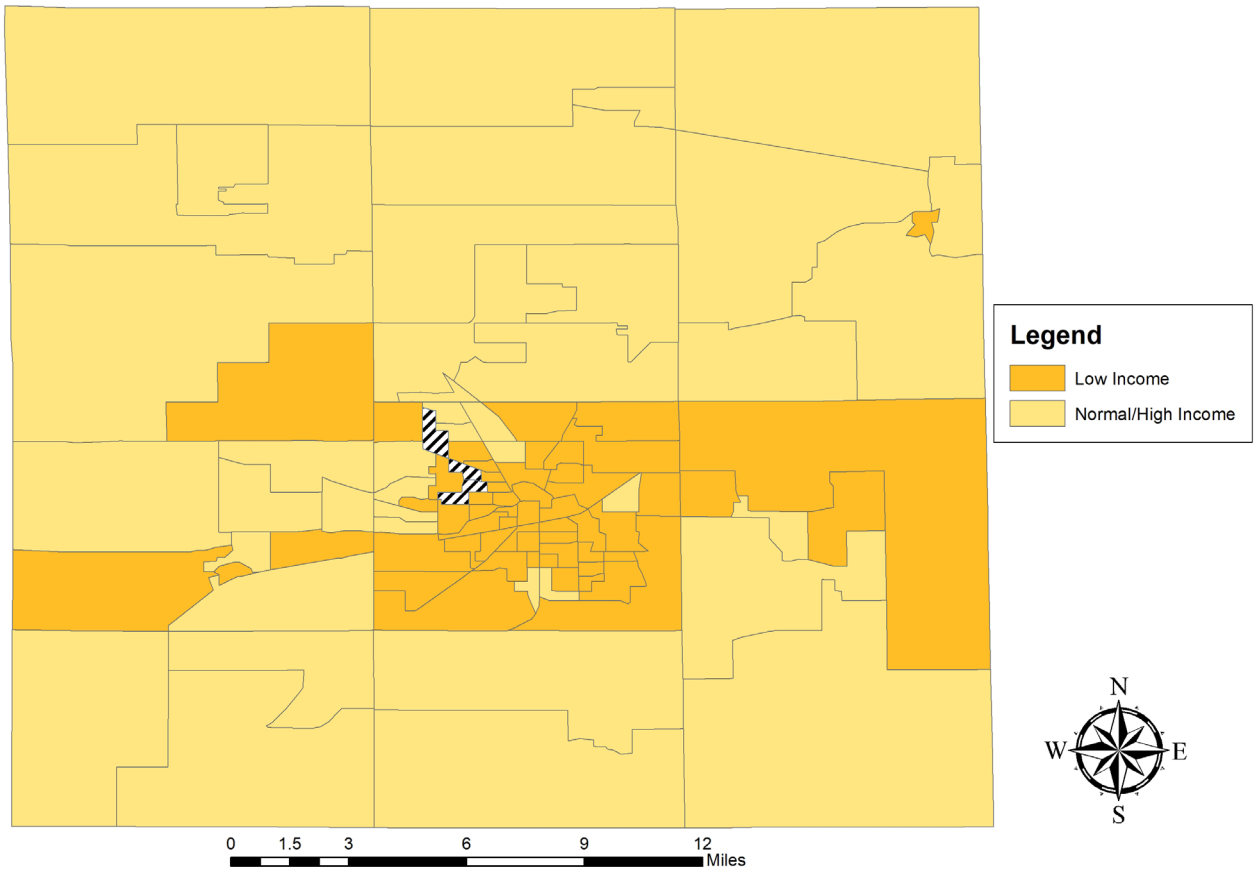
Above are definitions provided by the USDA Food Security Assessment Toolkit: Food Security, Food Insecurity, and Hunger (Cohen et al, 2002).

Food Deserts and Healthy Food Access

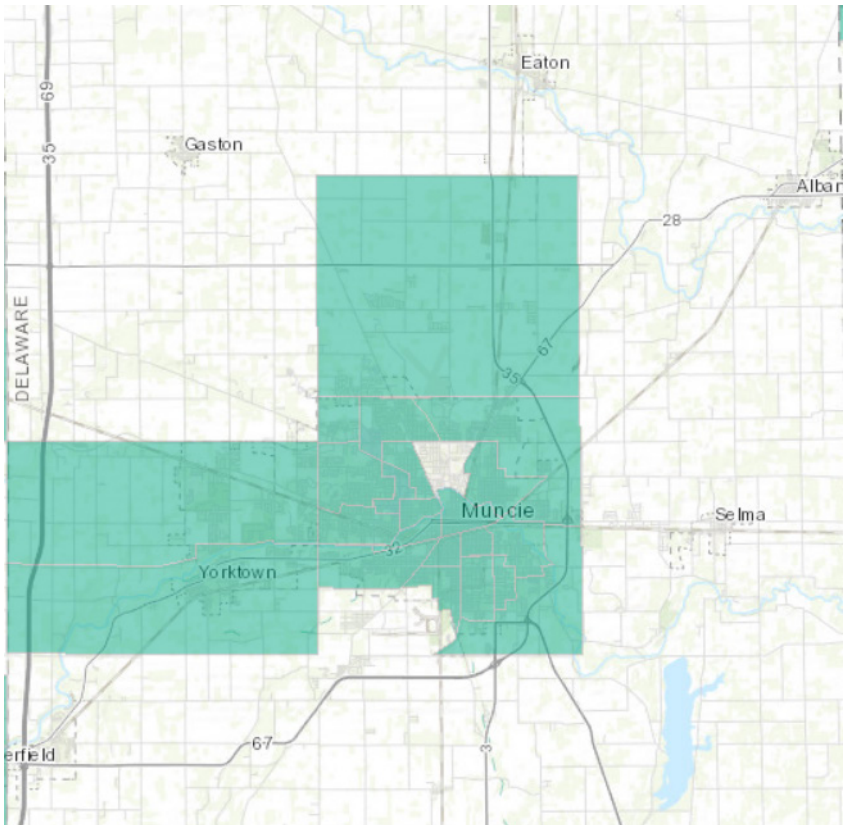
According to the USDA, "A **food desert** is a low-income census tract where either a substantial number or share of residents has low access to a supermarket or large grocery store." The following section will analyze food access barriers at the census block and census tract levels. In the adjacent maps, the spatial unit used to identify food deserts are census block groups. Block groups were chosen because they are smaller than tracts.

Top Opposite: The top map on the opposite page shows Delaware County low income census blocks. "Low income" blocks were defined as those where median household income for the block group is at or below 80 percent of the state's median household income.It can be observed that the majority of the low income blocks are clustered within Muncie township, which is composed of the square at lower center. Almost all of Muncie is considered low-income by the above definition, except for select neighnorhoods to the north and east of Ball State University's campus. We also see noteable low income pockets within other areas of the county, most notably the town of Albany, and several area blocks within Yorktown. The low income areas are often the most densely populated areas of Delaware County.

Bottom Opposite: The bottom map on the opposite page shows "Low access" census tracts in which at least 500 people or 33% of the population lives farther than 1/2 mile (urban) or 10 miles (rural) from the nearest supermarket. The City of Muncie emerges again as an area with limited access to grocery stores, along with the census block just north of the township and the census block directly to the west. The western census block encompasses the town of Yorktown, which is home to significant numbers of low income residents.



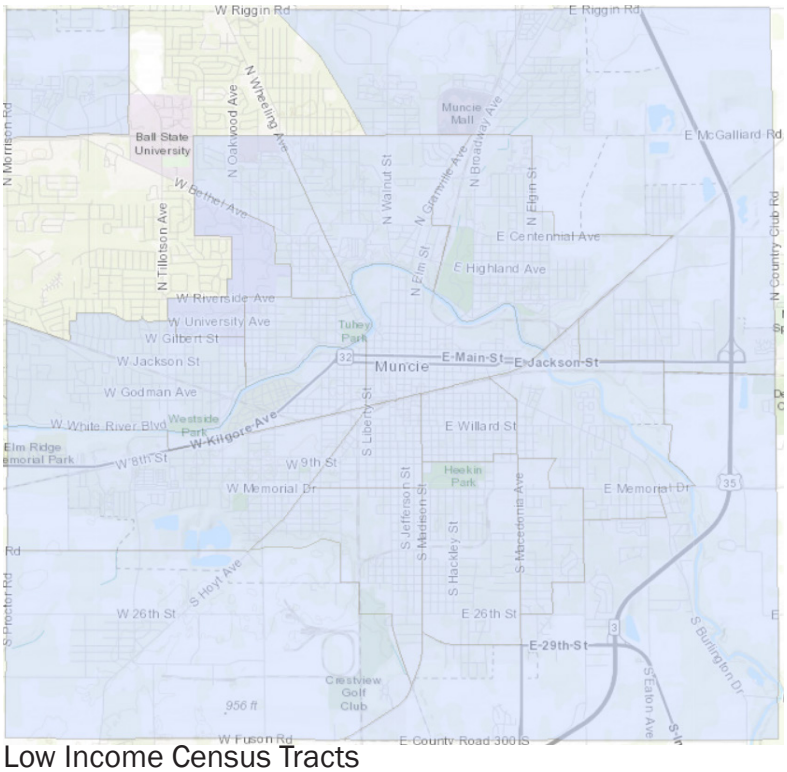
Income by Census Block



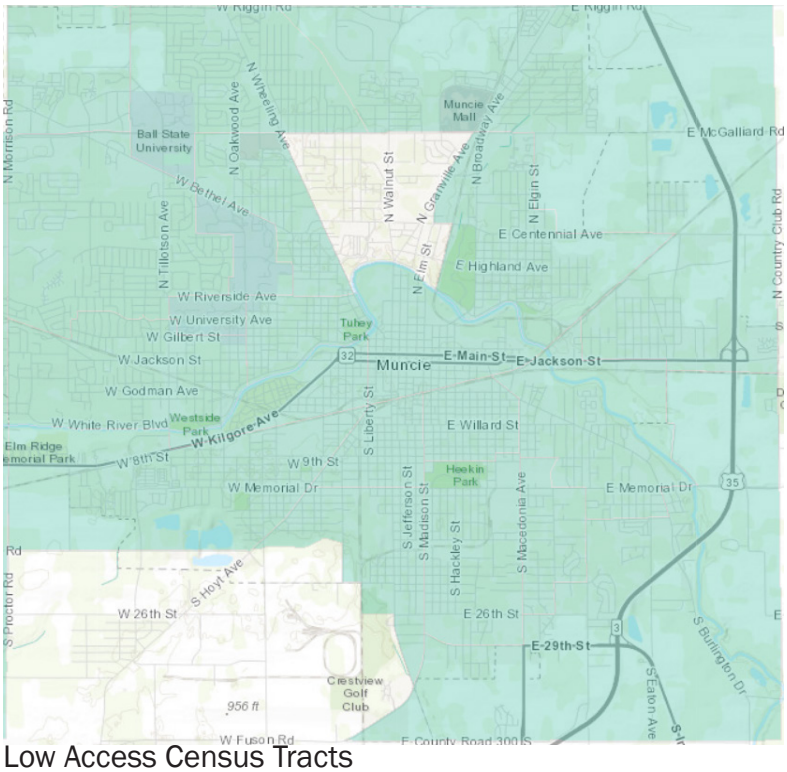
Grocery Store Access by Census Block

Food Deserts and Healthy Food Access

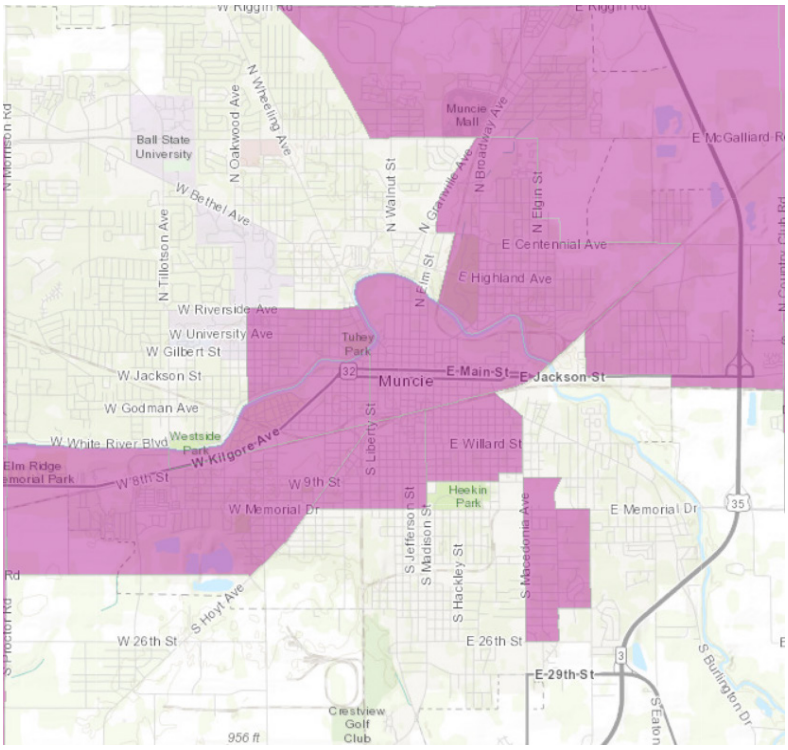
If we examine the City of Muncie within Delaware County, specific neighborhoods affected by food access limitations emerge. Below are images from the Food Access Research Atlas provided by the USDA's Economic Research Service. These maps show common barriers to food security by census tract in the city of Muncie. By observing the confluence of the three factors: poverty, lack of access to grocery stores, and lack of transportation, we can identify the most vulnerable areas. The image to the left shows the tracts with a poverty rate of 20% or higher, or tracts with a median family income less than 80% of median family income for the state or metropolitan area. The image in the lower left corner of this page demonstrates census tracts in which at least 500 people or 33% of the population lives farther than 1/2 mile (urban) or 10 miles (rural) from the nearest supermarket.



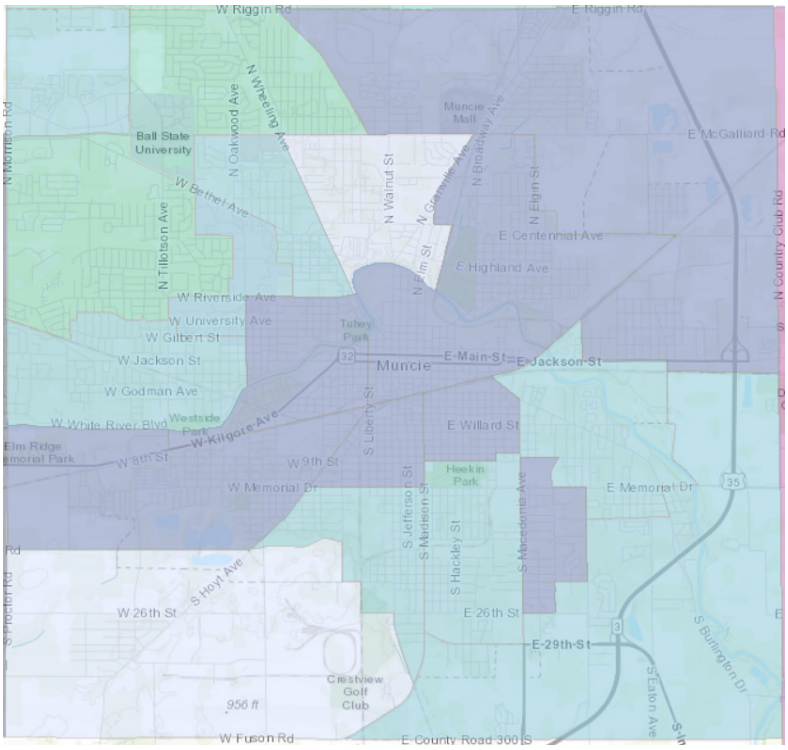
Low Income Census Tracts



Low Access Census Tracts



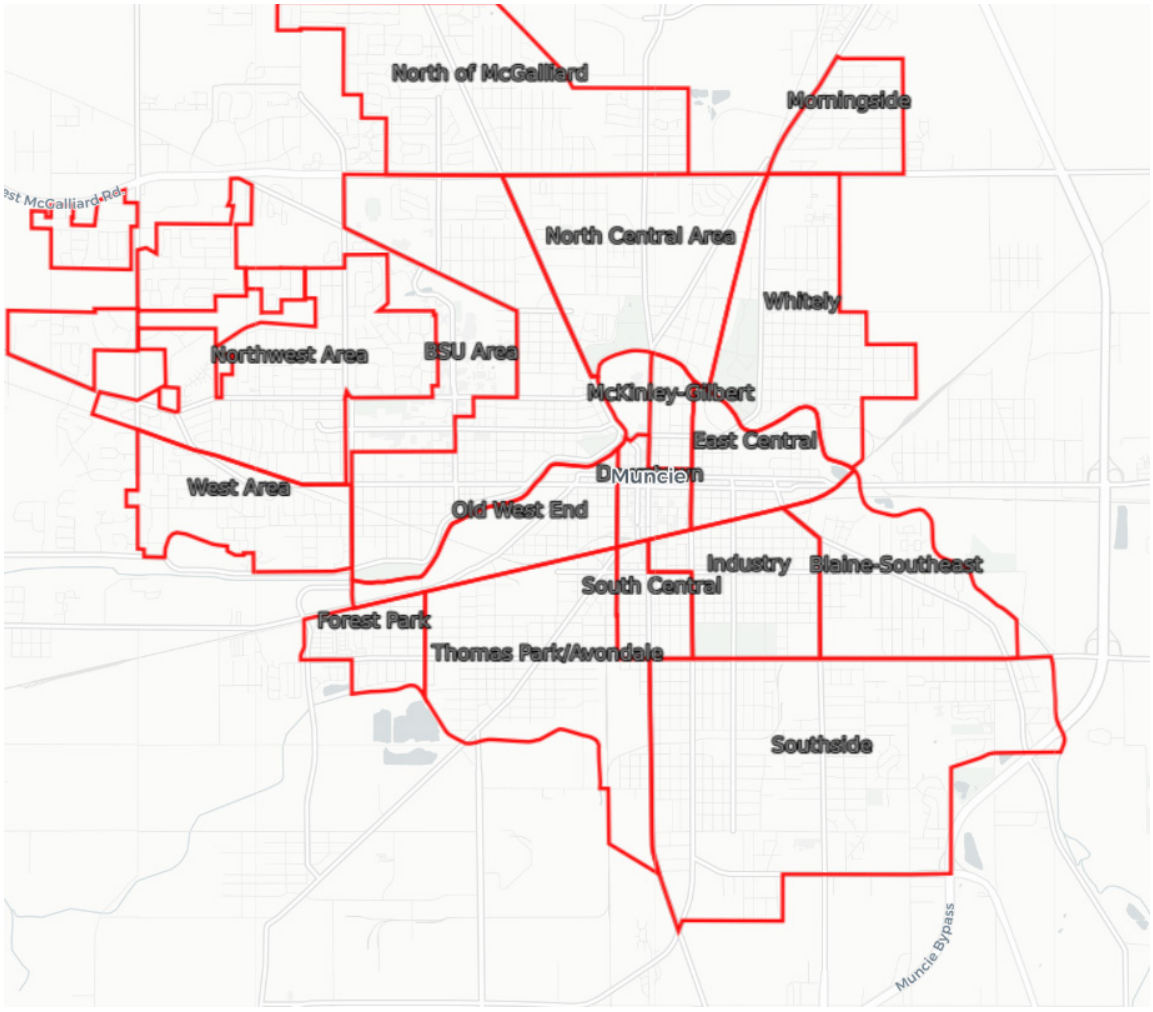
Low Vehicle Acces Census Tracts: Tracts in which more than 100 households have no access to a vehicle and are more than 1/2 mile from the nearest supermarket.



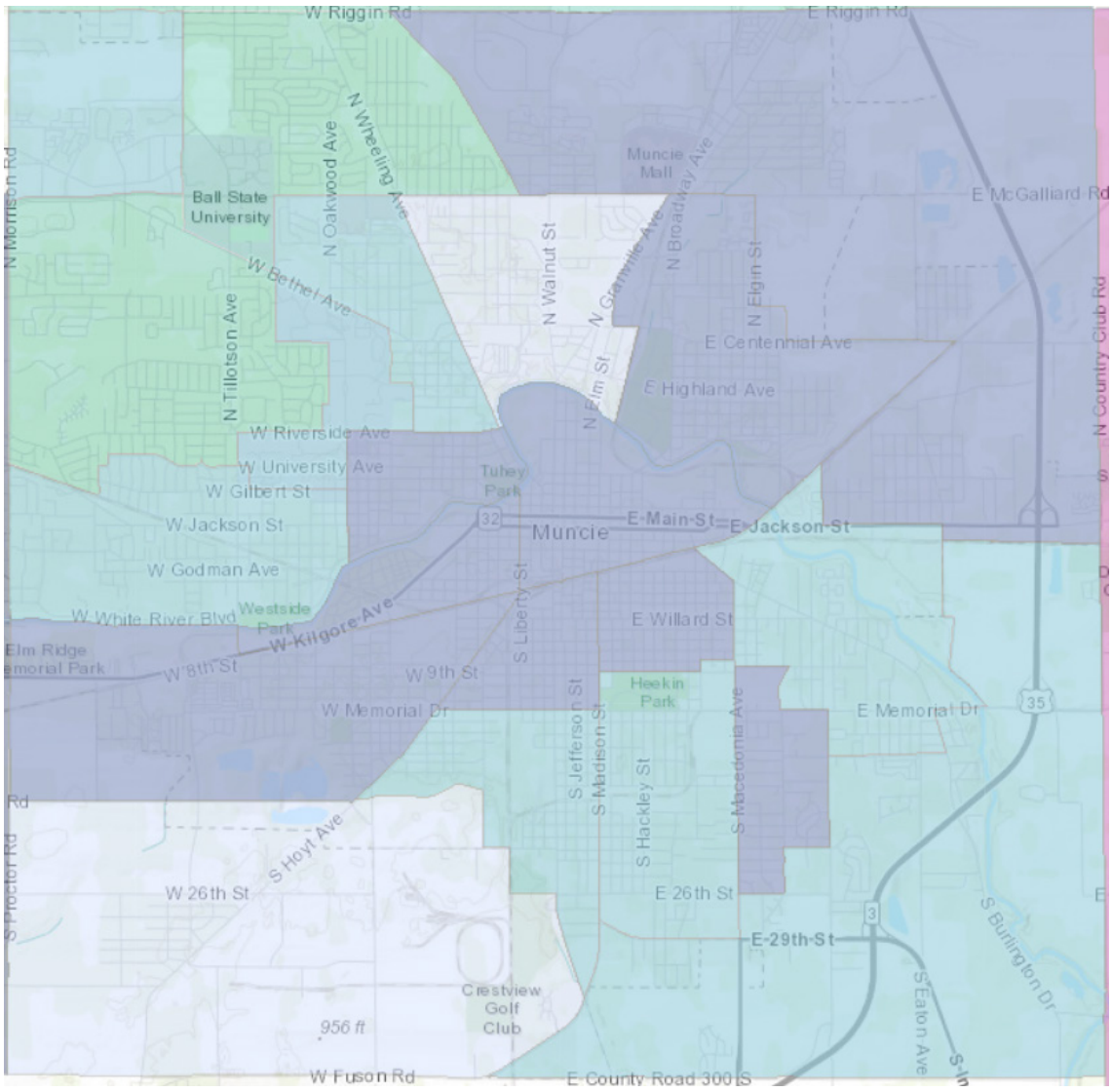
Combined Access Layers accross Census Tracts: Layered combination of all three food insecurity variables: low income, low access, and low vehicle access.

Food Deserts and Healthy Food Access

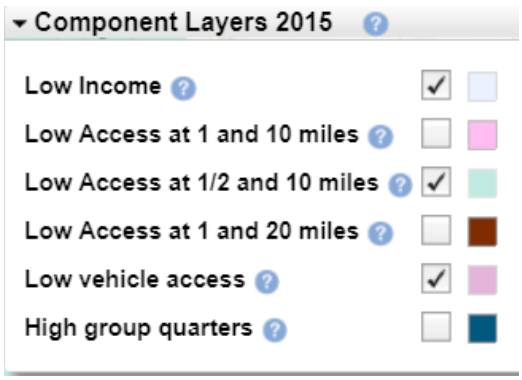
A troubling combination of low income, low grocery store access, and low vehicle access can be observed in several Muncie neighborhoods. The communities of Morningside, Whitely, East Central, South Central, Industry, Forest Park, Old West End, McKinley-Gilbert, and Downtown are encompassed by all three food insecurity barriers. Therefore, future and current food security inititives should target these areas. Parts of Southside, North of McGalliard, and BSU areas are also significantly affected by a combination of all three food access limitations. It is worth noting that every census tract of Muncie township is impacted by at least one of the access limitations, be it income, store distance, or vehicle accessiblity. This suggests a wider need for economic development in the community as a whole, even as concerned groups strive to mitigate food access barriers for the most vulnerable populations.



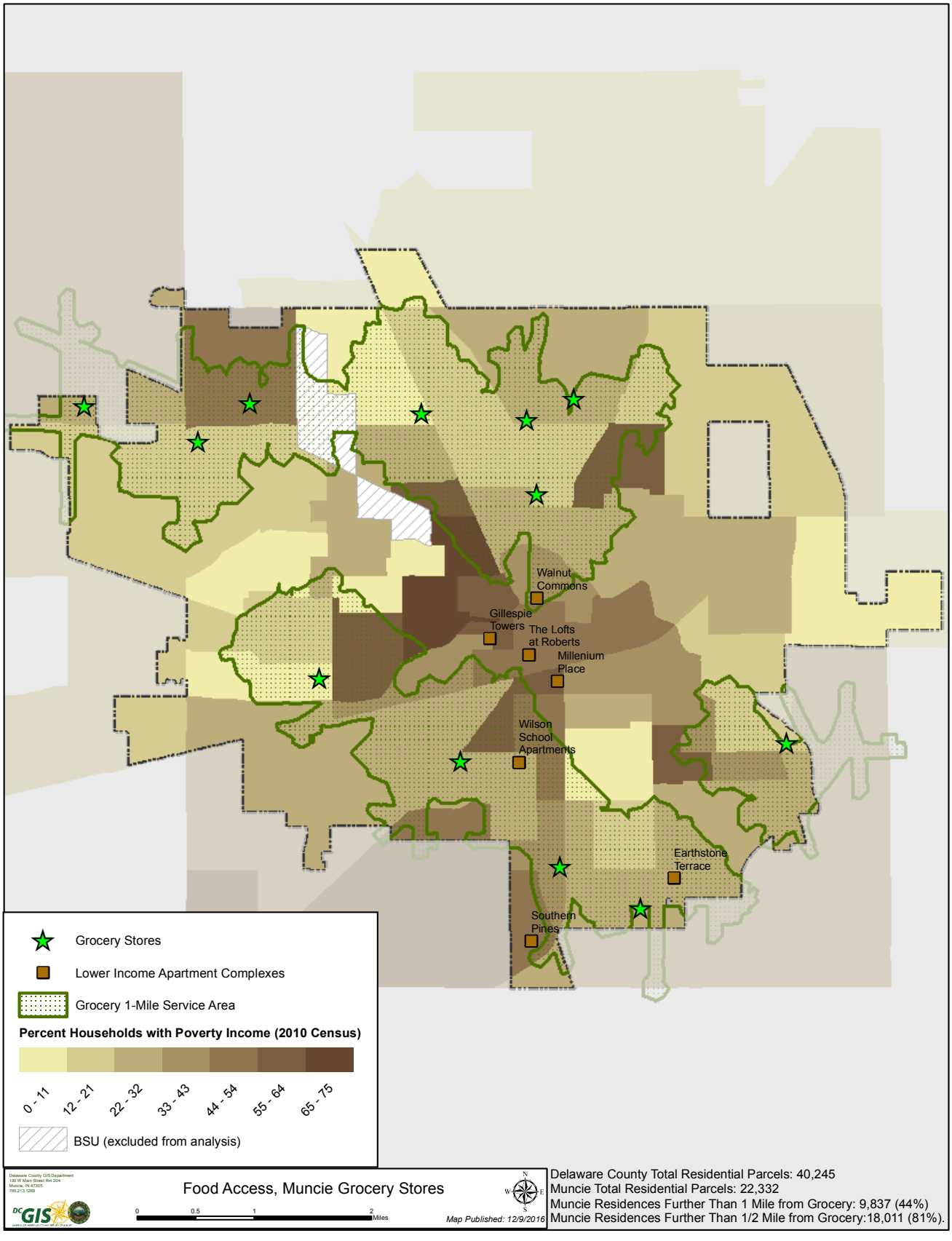
Muncie neighborhoods (Delaware County Department of Geographic Information Systems)



Combined Access Layers accross Census Tracts

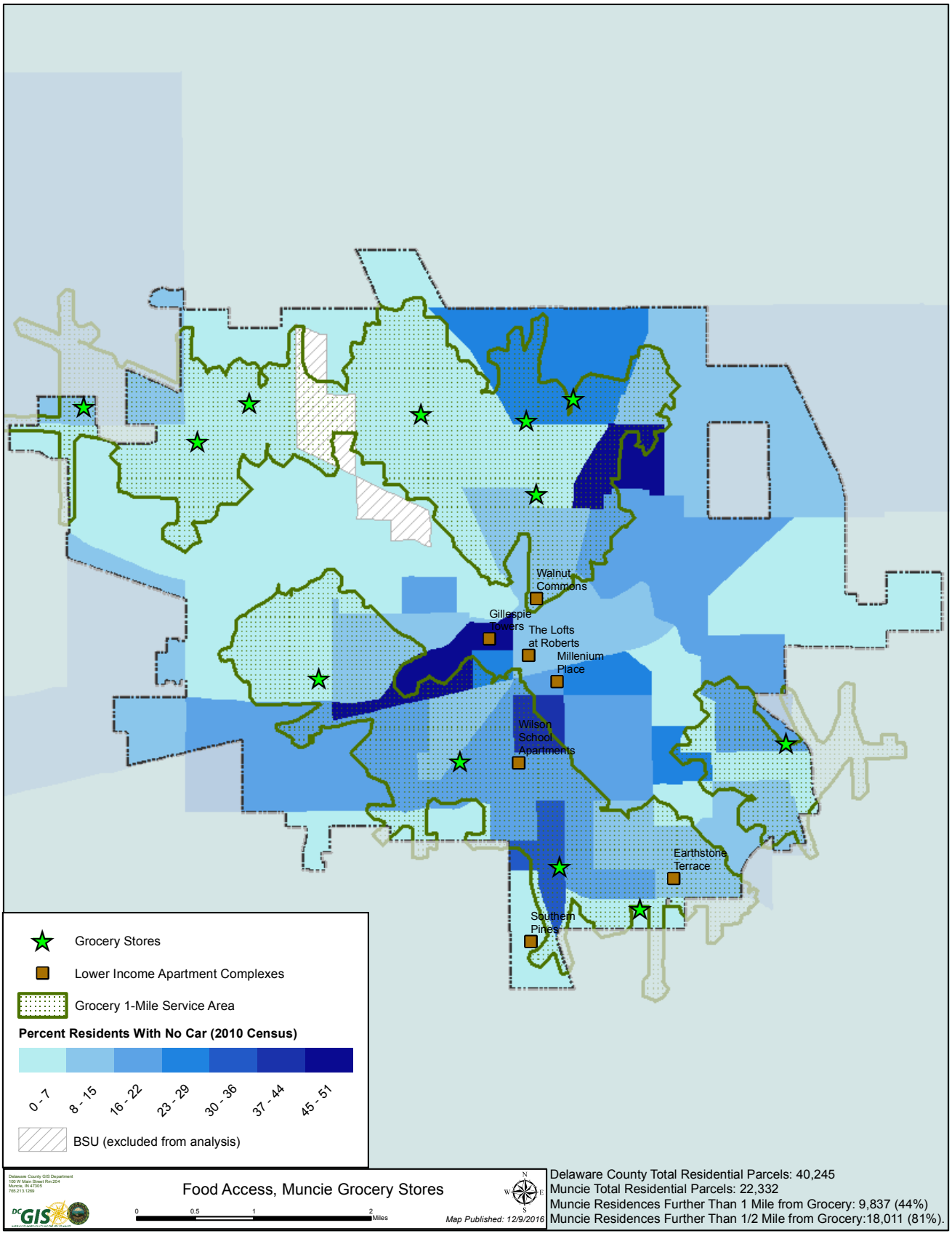


Grocery Store Access and Poverty Rates



Delaware County Total Residential Parcels: 40,245
Muncie Total Residential Parcels: 22,332
Muncie Residences Further Than 1 Mile from Grocery: 9,837 (44%)
Muncie Residences Further Than 1/2 Mile from Grocery:18,011 (81%).

Grocery Store Access and Vehicle Access



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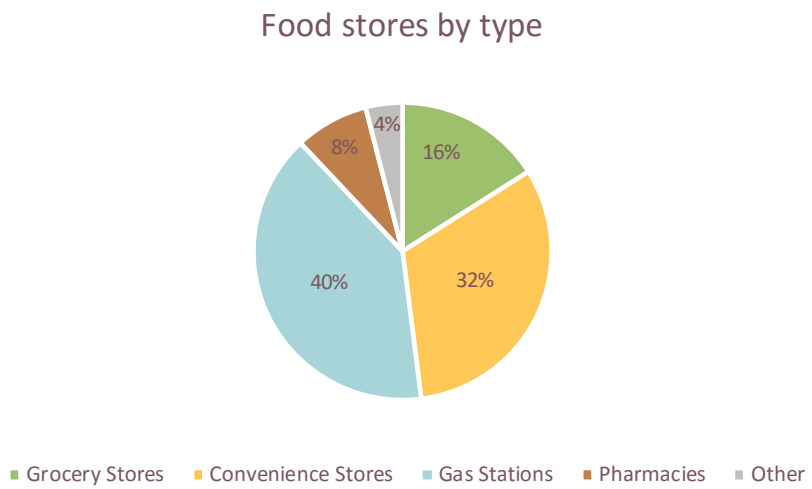
Food Stores

Assuming that residents are able to access supermarkets and grocery stores, what foods are available to purchase? This section attempts to identify product availablity and cost at food stores in Delaware County compared to national averages. In February 2016, food store data was collected from Reference USA using the Standard Industrial Classification (SIC). The store types and addresses were then confirmed by either visiting the locations or by visual match making use of google maps. After discarding those stores that did not exist anymore, duplicated addresses and owner addresses, we were left with 100 food stores. The stores were classified into one of the following 5 categories as defined by the North American Industry Classification System (NAICS):

- Grocery stores/Supermarkets: primarily engaged in the retail sale of all sorts of canned foods and dry goods, such as tea, coffee, spices, sugar, and flour; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry.
- Convenience stores: establishments (except those with fuel pumps) primarily engaged in retailing a limited line of goods that generally includes milk, bread, soda, and snacks. This category includes village pantries, dollar stores.
- Pharmacies: Establishments engaged in the retail sale of prescription drugs, and non-prescription medicines, which may also carry related lines, such as cosmetics, toiletries, tobacco, food, and novelty merchandise.
- Gas Stations: establishments primarily engaged in selling gasoline, but may be combined with other activities, including grocery sales.
- Other: Food retailers that do not fall under any of the other categories (NIACS, 2017).

Using this classification, less than 1 in every 5 (16%) of food retailers at the time of study were grocery stores. On the other hand, almost 3 out of 4 (73%) food stores in the county were either gas stations or convenience stores. This disparity between the number of grocery stores and convenience food stores increased as of June 2017 after the closure of the 4 Marsh stores located in Muncie.



Grocery Products

Led by Dr. Joshua Gruver at Ball State Univeristy, a team of student researchers collected food store data, such as products, prices, and weights, from all five store categories throughout the month of March 2016. The data was collected using the Food Stores Survey Instrument available in the USDA Community Food Security Assessment Toolkit (Cohen et al, 2002). This methodology uses the Thrifty Food Plan market basket as a metric by which we can answer the following key questions:

- Is a variety of food available in retail stores?
- Are the available foods affordable to low income households?
- Can the Thrifty Food Plan (TFP) market basket be purchased from these retailers at or below the TFP cost threshold set by the USDA (Cohen et. al, 2002)?

The USDA's TFP is a national standard for a nutritious diet at minimal cost and is used as the basis for food stamp allotments (Cohen et. al, 2002).

The food items and the quantities used in the TFP list are supposed to be representative of foods that meet Federal dietary guidelines and Food Guide Pyramid serving recommendations for a family of four (two adults aged 20 to 50 and two children aged 6 to 8 and 9 to 11) for 1 week.

> "Because the TFP is based on a single week's menues and recipes, it is not meant to be representative of any individual household's food needs or habits. Rather, it is intended to serve as a standard for assessing the availability and affordability of a standardized TFP basket across food stores (Cohen, 2002)."

This assessment was conducted using a the TFP survey to determine the food products available at area retail stores an their price points.

Out of the 100 identified stores, a total of 44 stores were surveyed. We were able to compare the item prices across stores by normalizing the cost into a specific price per unit. As it can be seen in the table on the next page, the percentage of stores surveyed varies across store types. On the lower end we have convenience stores and gas stations with only about a third of those stores surveyed, while on the higher end we have pharmacies, grocery stores and other stores at 50%, 62.5%, and 100% of the stores surveyed respectively.

Product Availability

The following is a table showing the average percentage of items missing by store type and food category. On average, gas stations were the stores missing the highest percentage of items, with over 70% of TFP items missing from store shelves. The only store type with more than half of the survey food items available were grocery stores. While grocery stores are regarded as the major source of nutritious and healthy food items, on average they were missing 1 in every 10 items on the list. This shows that even people with access to grocery stores within a reasonable distance from their homes might struggle to find the food they require for a healthy diet.

	Number of Stores	Number of Stores Surveyed	Percentage of Stores Surveyed
Grocery Stores	16	10	62.5%
Convenient Stores	32	12	37.5%
Pharmacies	8	4	50%
Gas stations	40	14	35%
Others	4	4	100%
Total	100	44	44%

	Grocers-retail	Convenient Stores	Pharmacies	Gas stations	Others
Fruit - Fresh	4%	85%	100%	90%	100%
Vegetable - Fresh	1%	100%	100%	100%	100%
Fruit - Canned	0%	25%	0%	54%	63%
Vegetable - Canned	7%	44%	17%	62%	42%
Fruits & Vegetables - frozen	6%	72%	90%	86%	100%
Breads, Cereals - fresh	8%	24%	22%	58%	41%
Breads, Cereals - dry	8%	24%	22%	58%	41%
Dairy - fresh	4%	35%	25%	59%	85%
Dairy - Canned	10%	50%	25%	93%	50%
Meat – Fresh	19%	73%	75%	85%	100%
Meat - Frozen canned	6%	47%	50%	64%	70%
Fats and oils	8%	29%	13%	43%	56%
Sugar and sweets	12%	41%	42%	57%	50%
Other foods	16%	55%	45%	75%	46%
Overall	10%	55%	52%	72%	66%

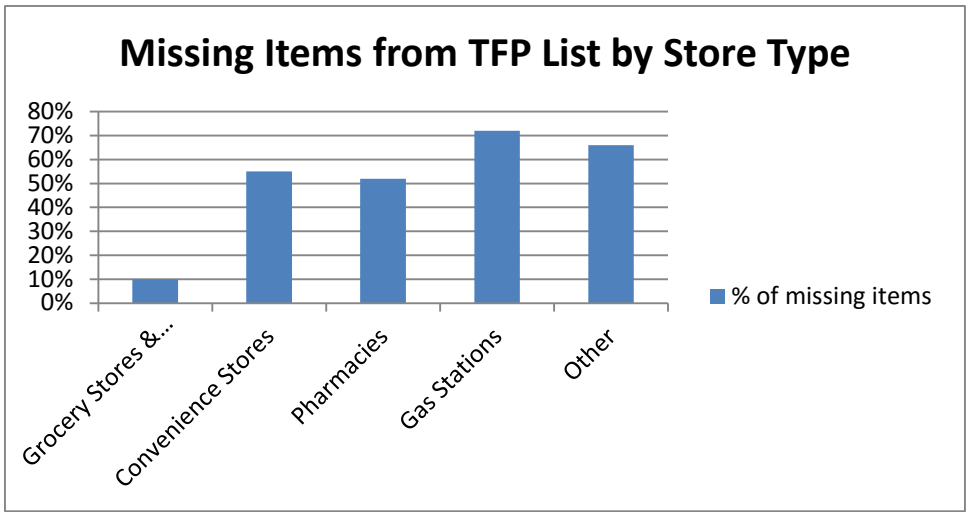
Percentage of Grocery Items Missing, by Store Type

Surprisingly, excluding grocery stores, none of the surveyed food stores including gas stations, pharmacies and convenience stores carried any of the items listed under the fresh vegetable category (carrots, potatoes, etc.). These same stores seem to rarely carry fresh fruits, however, if they did carry fruit, the selection was usually limited to oranges, apples or bananas. Also widely missing from these stores were frozen vegetable items, a type of food that many families depend on for easy meal preparation on a daily basis.

Fresh meat products, considered by some to be essential for a healthy diet, was the most missed item among food stores, including grocery stores. Approximately 1 out of every 5 fresh meat products listed by the USDA tool kit was missing from the survey of grocery stores. Among convenience stores, pharmacies, and gas stations, shoppers could expect to find only 15-20% of fresh meat products listed in the TFP basket.

Fast Facts:

- Over 75% of food retailers in Muncie and Delaware County are convenience stores, gas stations, or pharmacies.
- Convenience stores, gas stations, and pharmacies were missing 100% of fresh vegetables listed in the USDA TFP food list (See Apendix C).
- Grocery Stores/Supermarkets were missing 1 in every 10 items from the TFP grocery list.
- No store type provided 100% of TFP foods.
- Gas stations were most lacking in TFP foods missing 72% of listed items, followed by Other Stores, Convenience Stores, Pharmacies, and Gas Stations who were lacking 66%, 55%, and 52% of listed foods respectively.
- Gas stations provided the least product variety, but outnumber all other store types comprising 40% of food retailers in the county.

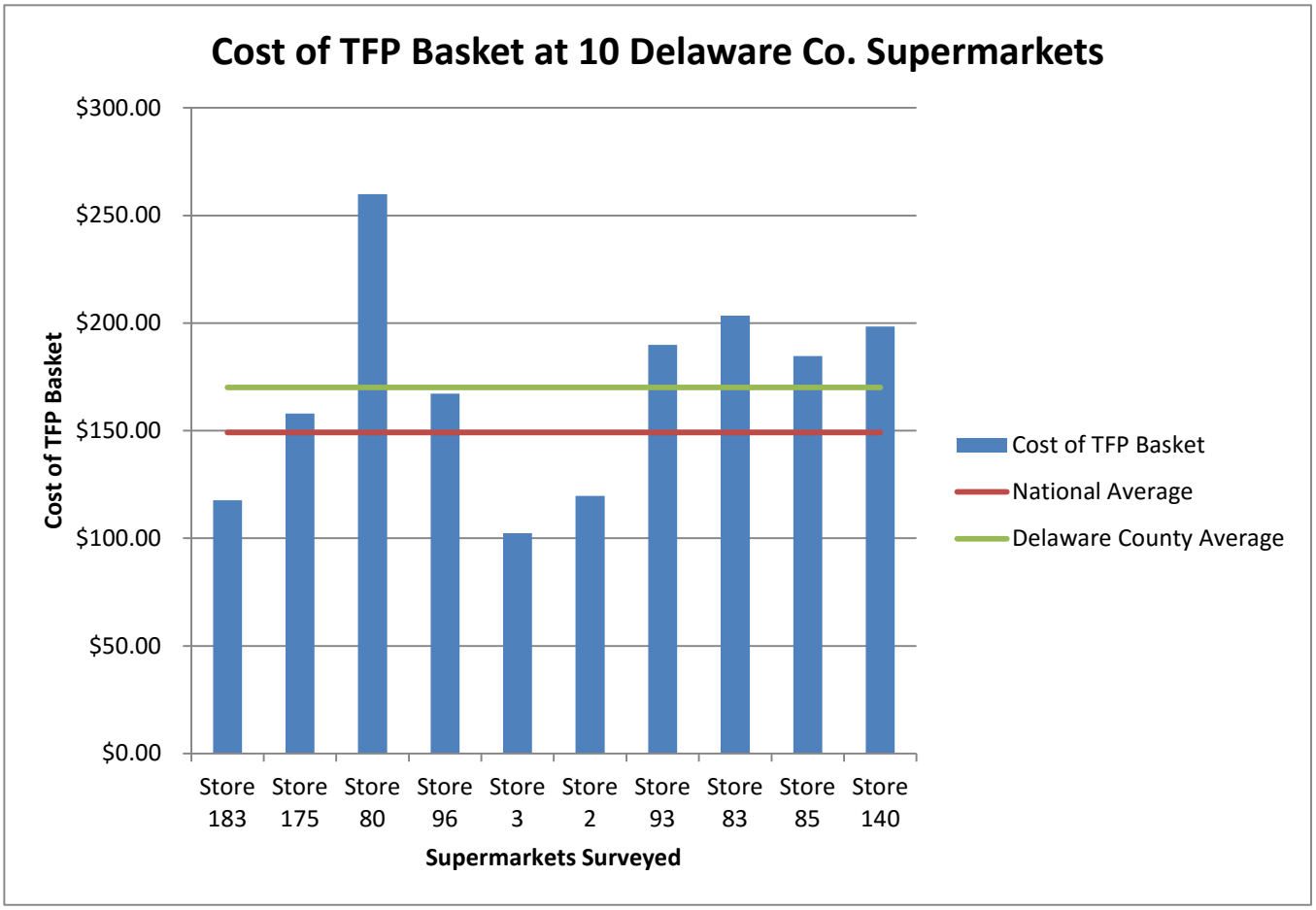


Cost of TFP Basket Among Grocery Stores

Ten grocery stores were surveyed for items and prices on the TFP food list. To protect the identity of individual stores, they are assigned a randomized identification number in the chart below.

Store	Cost of TFP Basket
Store 183	$117.60
Store 175	$157.92
Store 80	$259.95
Store 96	$167.19
Store 3	$102.39
Store 2	$119.71
Store 93	$189.91
Store 83	$203.40
Store 85	$184.73
Store 140	$198.34
National Average	$149.20
Delaware Co. Average	$170.11

Of the ten stores surveyed, seven were found to have TFP basket costs above the national average of $149.20, while three stores had TFP basket prices below that benchmark. The average TFP basket price for Delaware County (in March 2016) was $170.11, which is 14% more expensive than the national average. The lowest priced TFP basket cost $102.38, which is 46% less than the national average. The highest priced TFP basket cost $259.95 which is 74% more expensive than the national average. With 7 of 10 stores above the national mean and an average TFP price 14% higher than the national average, Delaware County compares unfavorably with the rest of the country in terms of grocery store food prices.



Emergency Food Resources

As the food access crisis in Muncie and Delaware County has intensified, numerous groups, established and new, have mobilized to provide emergency food resources for those in need. Non-profits, churches, schools, community centers, and concerned citizens have pooled efforts to form a network of pantries, meal services, and educational resources. Some noteable efforts are described below:

Since 1983, Second Harvest Food Bank of East Central Indiana has been feeding the hungry, advocating for those with food insecurity and providing nutrition education. With more than 21 percent of the region's children suffering from food insecurity, Second Harvest is focused on feeding kids through school pantries, a Food 4 Kids Backpack Program, and a youth enrichment program aimed at ending the cycle of poverty.

Through 2016 and 2017 Edible Muncie of Delaware County Inc. worked to eliminate hunger in Muncie and Delaware County by gathering, organizing and advocating for the wise use of resources to assist those in need. One of their major projects was an updated, centralized list of all emergency food providers in the region. Now that Edible Muncie has dissolved, Purdue Extension will take on the responsibility of maintaining this important database.

Emergency Food Resources List (Edible Muncie)

Day of the week	Name	Hours	Address (Bus # - Closest Stop)	Phone
Monday	High St. United Methodist Church (Christian Ministries Vouchers Required)	1:30 - 2:30 PM	219 S High St (MITS Downtown)	747-8500
	Muncie Mission	8:00 – 11: AM	1725 S Liberty (#11 - Walnut & Memorial)	288-9122
Tuesday	Salvation Army	3 - 4:30 PM	1015 N Wheeling (#3 - Minnetrista)	289-7924
	Community Shepherd Pantry (Wes-Del only)	9:30 - 10:30 AM	105 Main St, Gaston	358-3264
	St. Lawrence Catholic Church	1 - 3 PM	820 E Charles (#8 Charles & Hackley)	288-9223
	Muncie Mission	8:00-10:30 AM	1725 S Liberty (#11 - Walnut & Memorial)	288-9122
	High St. United Methodist Church (CM Vouchers)	1:30 - 2:30 PM	219 S High St (MITS Downtown)	747-8500
	Christian Ministries	10 AM - 12:30 PM	401 E Main St (#7 - Jackson & Elm)	288-0601
Wednesday	Christian Ministries	9 AM - 12:30 PM	401 E Main St	288-0601
Thursday	Christian Ministries	9 AM - 12:30 PM	401 E Main St (#7 - Jackson & Elm)	288-0601
	Muncie Mission	8:00 – 10:30 AM	1725 S Liberty (#11 - Walnut & Memorial)	288-9122
	St. Lawrence Catholic Church	1 - 3 PM	820 E Charles (#8 Charles & Hackley)	288-9223
	Salvation Army	1 - 2:30 PM	1015 N Wheeling (#3 - Minnetrista)	289-7924
Friday	Christian Ministries	9 AM - 12:30 PM	401 E Main St (#7 - Jackson & Elm)	288-0601
Saturday	Morning Star Pantry	10:30 - 11:30 AM	2000 S Hoyt Ave (#12 - Hoyt & 13th)	287-0021

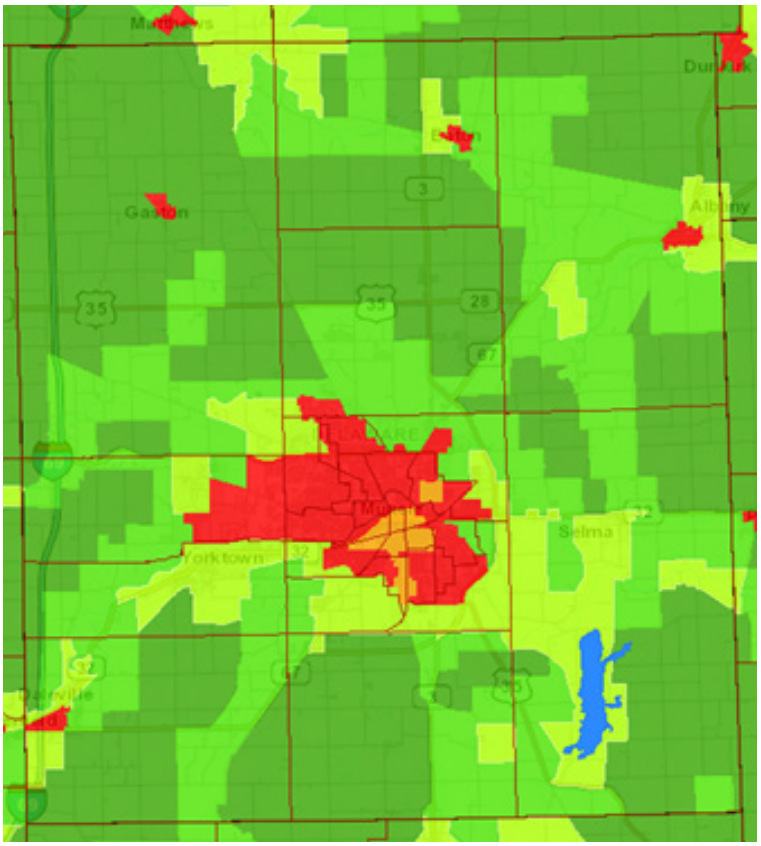
Day of the week	Name	Hours	Address (Bus # - Closest Stop)	Phone
Monday	Daleville UMC (Salem Township Only)	1st Mon: 9 AM - Noon	8104 S Hickory Lane	378-3000
	Forest Park Church of Nazarene (Requires Valid ID)	3rd Mon: 2 - 5 PM	2105 W Memorial (#12 - Clark & 12th)	288-4162
Tuesday	Albany UMC (Albany, DeSoto, Redkey, Eaton, Fairview, Dunkirk)	1st & 3rd Tue: 4 – 7 PM	125 N Broadway, Albany	789-4571
	Center Chapel UMC (Requires Valid ID)	*3rd Tues: 4 - 6 PM*	900 W Royerton Rd	*288-9490*
	The Compass Church Food Pantry " Servicios disponibles en espanol"	*1st Tues: 9:30 - 11 AM* *3rd Tues: 5:30 - 7 PM*	400 N 600 E, Selma	*282-1648*
Wednesday	Daleville UMC (Salem Township Only)	*1st Wed: 4 - 6 PM*	8104 S Hickory Lane	*378-3000*
	Blood-N-Fire	*Last Wed: 3 - 5 PM*	300 N Madison (#7 Main & Madison)	*747-0872*
Thursday	Daleville UMC (Salem Township Only)	*1st Wed: 4 - 6 PM*	8104 S Hickory Lane	*378-3000*
	Whitely Pantry (Area residents & WCC members)	*3rd Thur: 4-6 PM*	Harvest Christian Church 1010 E Centennial	*216-7655*
	Let Us Feed You Body & Soul	*1st Thur: 6 - 8 PM* *3rd Thur: 5 - 8 PM*	524 W Howard (#2 - Council & Howard)	*284-6445*
Friday	Muncie Christian Center	*2nd Fri: 4 - 6 PM*	1824 S. Walnut (#11 - Walnut & Memorial)	*289-9601*
	Christ Temple Church	*2nd / 4th Fri: Noon - 2 PM*	654 N Jefferson (#4 Columbus & Elm)	*587-4189*
Saturday	Friends Memorial Church	*3rd Sat: 8:30 - 11:30 AM*	418 W Adams (#2 - Adams & S. Cherry)	*288-5680*
	REACH (Yorktown & Mt. Pleasant Only)	*3rd Sat: 9 – 11 AM*	9108 Sutherland Ave.	*759-5582*

Frequency	Name	Hours	Address (Bus # - Closest Stop)	Phone
Daily (M – F)	Soup Kitchen of Muncie	*9:30 - 11 AM*	920 E Charles St (#8 - Charles & Hackley)	*287-8439*
	Muncie Mission	*12:30 - 12: 50PM*	1725 S Liberty (#11 - Walnut & Memorial)	*288-9122*
Weekly - Saturday	Blood-N-Fire	*4:30 PM (Doors open at 4)*	300 N Madison (#7 - Main & Madison)	*747-0872*
	Westminster Bread Basket	*10 - 11:30 AM*	2000 S Hoyt Ave (#12 - Hoyt & 13th)	*287-0021*
Weekly - Sunday	Grace Episcopal Church	*3 PM*	300 S Madison	*289-7931*
Monthly – 4th Wednesday	Covenant Partners Ministries --	*7:30 AM (3rd Wed during Nov. & Dec.)*	911 W Jackson St (#2 - Kilgore & Jackson)	*284-2545*

For a comprehensive review of emergency food resources, we defer to the excellent database compiled by Second Harvest. These admirable emergency assistance networks are critical to the survival of our community, yet underscore the need for building comprehensive food security through a strenthened local food system. Multifaceted community mobilization will be critical to build a sustainable, accessible, and equitable food value chain where emergency resources are called upon only in true crises, and citizens can meet their day to day nutrition needs through conventional channels.

Local Farms

Delaware County has a strong agricultural presence with a long history of farming. Commodity crops such as corn and soybeans dominate land use, production, and sales, however, a diverse range of other products is also produced in the region. Nursery and greenhouse products; milk and dairy products; vegetables, melons, potatoes and sweet potatoes; and cattle and calves produce notable revenue streams and are often distributed through the local food system, connecting producers and consumers in the region. Although these specialty crops and animal products comprise a small portion of total acreage allocation and revenue in comparison to commodity corn and soy, they are often the primary products of small farms, which make up over 84% of total farms in Delaware County.



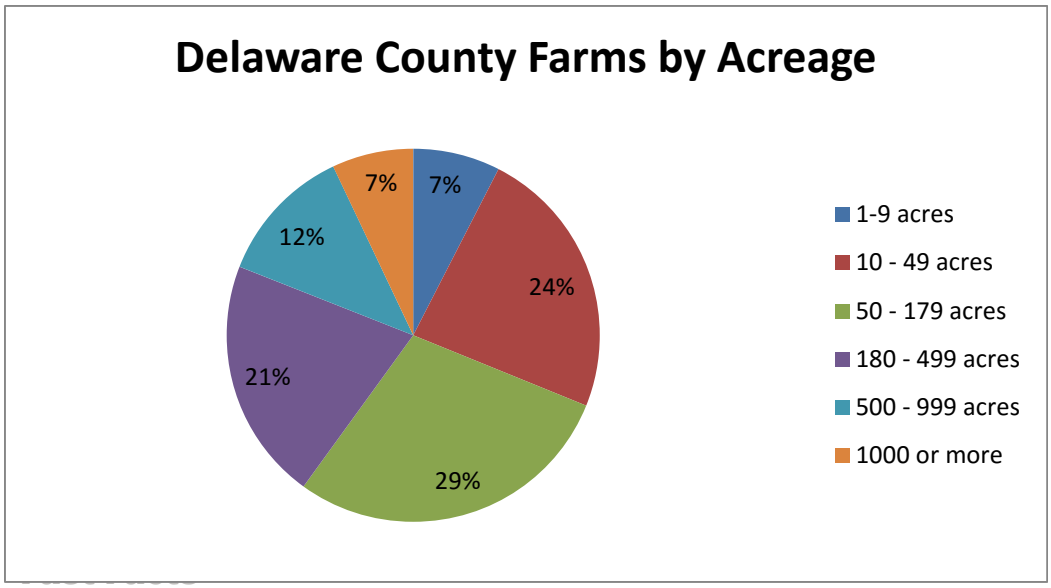
Cultivated land in Delaware County (maps.indiana.edu)

Fast Facts (USDA, 2012):

- Number of farms in Delaware County: 610
- Land in Farms: 175,266 acres (70% of total land area in Delaware Co.)
- Market Value of Agricultural Products Sold: $125,560,000
- Crop Sales: $116,998,000 (93%)
- Livestock Sales: $8,562,000 (7%)
- Top Crops by land use (acres):
  Corn for grain: 75,765
  Soybeans for beans: 73,921
  Forage (hay, silage): 2,266
  Popcorn: 1,971
  Wheat for grain: 1,461

Farm Size

Delaware County is home to farms of many sizes, with 366 farms (60%) operating on less than 180 acres. Approximately one third of all farms in the county (31%) operate on less than 50 acres. The median farm size is 50 acres while the average farm size 287 acres, a 23% increase from the 2007 average size of 234 acres. This this trend toward increasing farm size reflects the loss of 73 very small farms (farms with 1-9 acres) and the establishment of several larger farms between 2007 and 2012.



- 60% of farms in Delaware County operate on less than 180 acres
- Approximately 1/3 of farms operate on less than 50 acres
- Median farm size is 50 acres
- Average farm size is 287 acres

Size	# of Farms	Percentage
1-9 acres	46	7.5%
10 - 49 acres	144	23.6%
50 - 179 acres	176	28.9%
180 - 499 acres	128	21.0%
500 - 999 acres	73	12.0%
1000 or more	43	7.0%

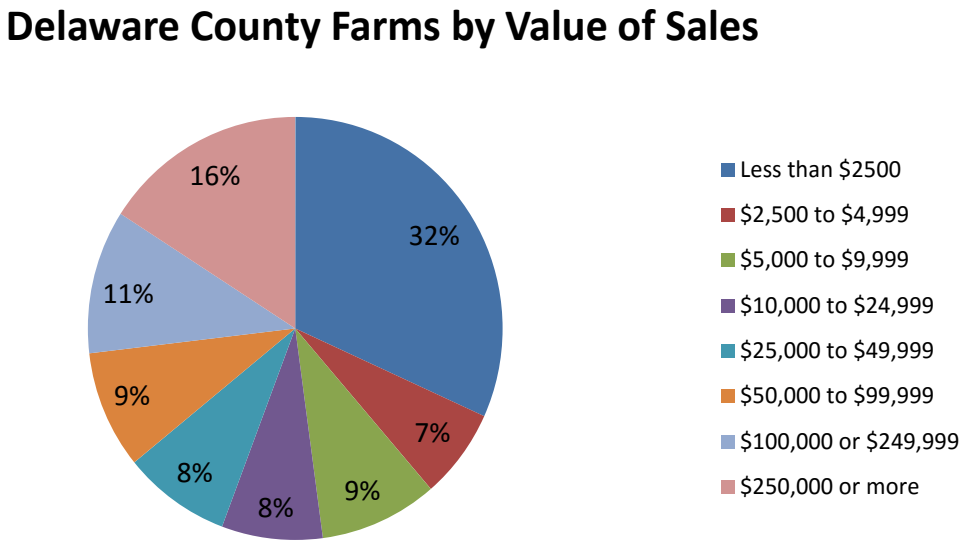
Farm Revenue

Examination of farm revenue reveals much about the productivity and profitability of Delaware County farms. At the time this data was collected, the USDA defined a 'small farm' as one with gross cash farm income (GCFI) of less than $250,000. By this definition, 84% of farms in Delaware County are considered 'small.' The USDA has since revised this definition, raising the gross cash farm income threshold for a small farm to $350,000 (USDA, 2015). Only 16% of farms report sales over $250,000 and most farms in Delaware County do not even approach this GCFI threshold. More than half (54%) report GFCIs less than $25,000 and almost 1/3 report GFCIs less than $2,500. This data points to number of factors that reflect considerations other than economic gain motivating people to pursue farming; i.e. some farms are rural-residence family farms including retirement farms whose operators report they are retired, or residential/lifestyle farms whose operators report a major occupation other than farming. This data may also indicate that many small farms intended as business ventures struggle to attain sufficient profitability to sustain a living wage for owner/operators.

Fast Facts:

- Small farms (with sales < $250,000) make up 84% of farms in Delaware County (USDA 2012).
- Approximately 1/3 of farms in Delaware County earn less than $2,500 per year (USDA, 2012).
- 54% of farms earn less than $25,000. This is $14,500 below the median household income in Delaware County of $39,537 (USDA, 2012).
- Only 36% of farms earn $50,000 or more (USDA, 2012), meeting the estimate for a living wage of $49,490 for a family with two working adults and one child in the state of Indiana (MIT, 2018).

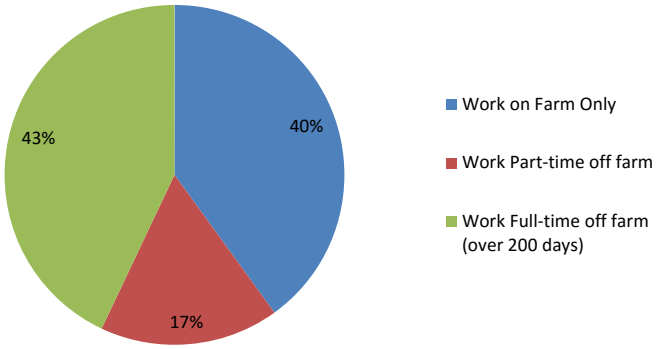
Delaware County Farms by Value of Sales		
Value of Sales	**# of Farms**	**Percentage**
Less than $2500	194	32%
$2,500 to $4,999	42	7%
$5,000 to $9,999	56	9%
$10,000 to $24,999	48	8%
$25,000 to $49,999	51	8%
$50,000 to $99,999	55	9%
$100,000 or $249,999	67	11%
$250,000 or more	97	16%



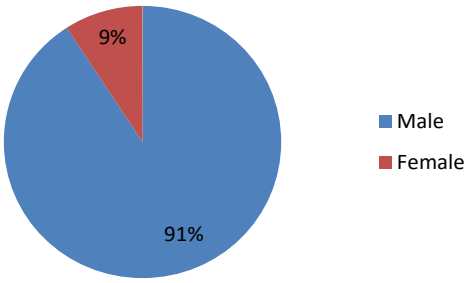
Farm Operators

"The farm operator is the person who runs the farm, making the day-to-day management decisions. The operator could be an owner, hired manager, cash tenant, share tenant, and/or a partner... In the case of multiple operators, the respondent for the farm identifies who the principal farm operator is during the data collection process (USDA ERS, 2017)." 60% of principle farm operators (PFOs) in Delaware County hold outside employment, with 43% of PFOs working outside the farm for more than 200 days during the year.

Employment of Principle Farm Operators



Principle Farm Operators by Gender

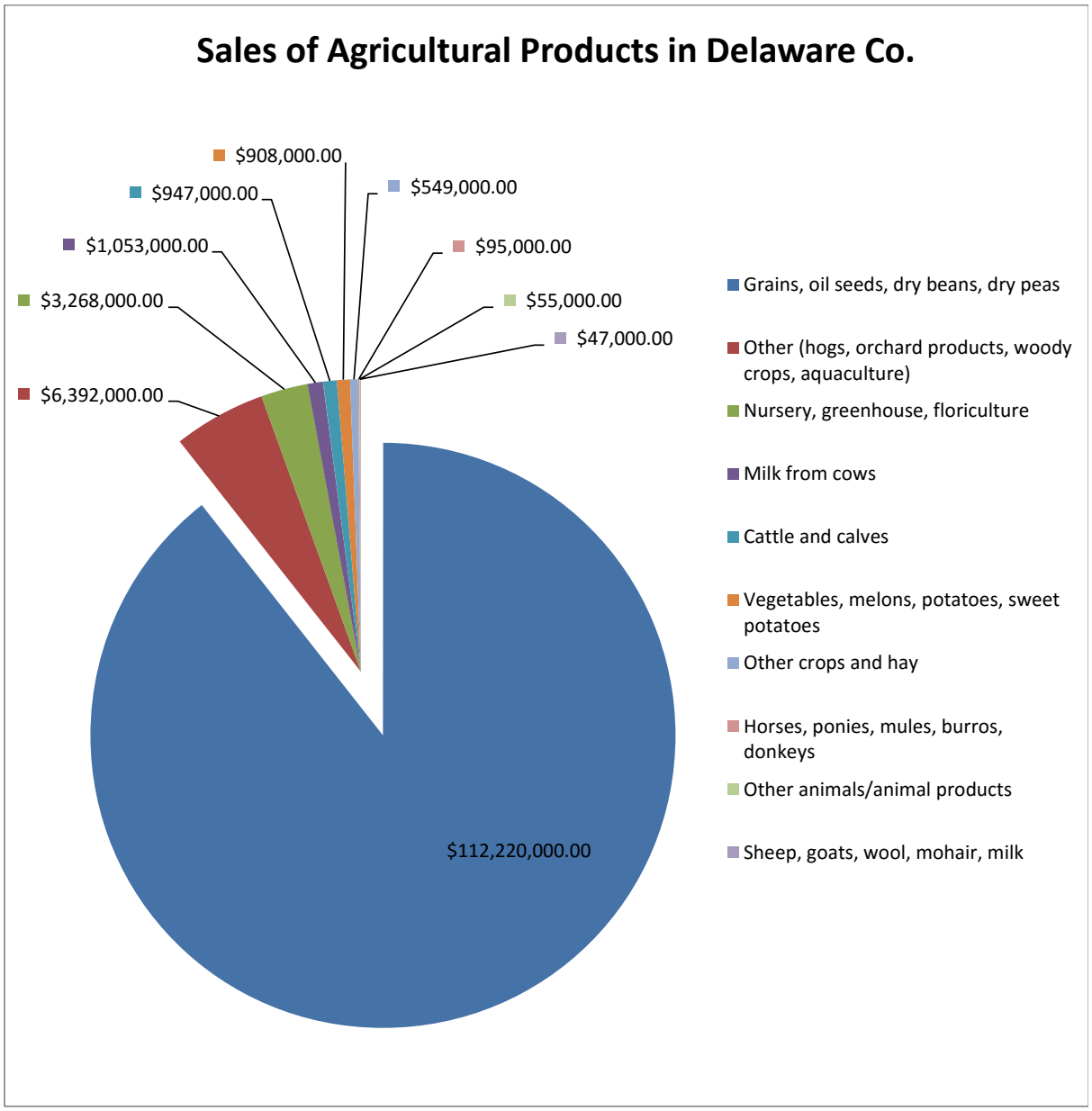


Employment of Principle Farm Operators (PFOs)		
Employment Status	# of PFOs	Percentage
Work on Farm Only	244	40.0%
Work Part-time off farm	104	17.0%
Work Full-time off farm (over 200 days)	262	43.0%

Principle Farm Operators by Gender		
Gender	# of PFOs	Percentage
Male	554	90.8%
Female	56	9.2%

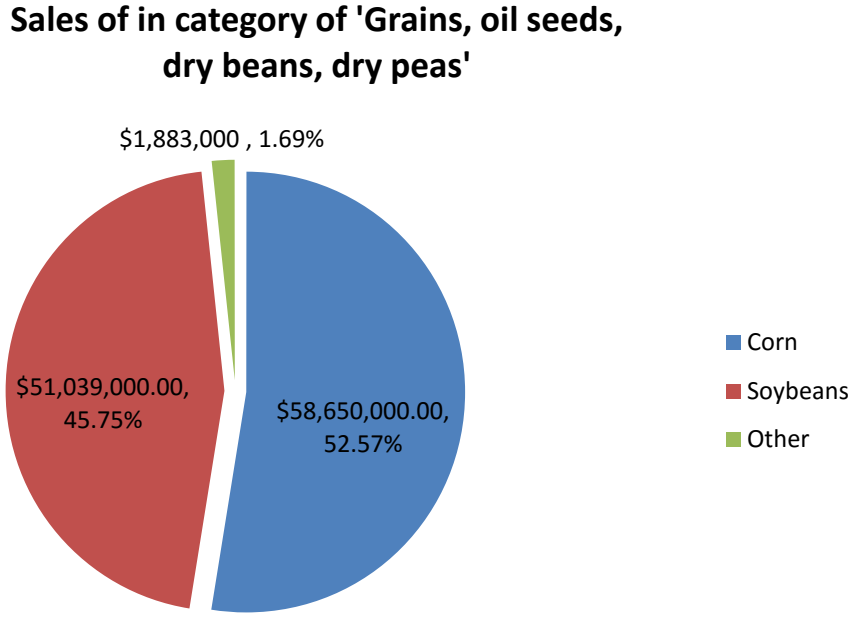
Fast Facts:

- 60% of principle farm operators hold outside employment
- 43% of principle farm operatores work 200 days or more in employment outside of the farm
- Average age of principle farm operators is 60.3 years.
- 91% of PFOs are male and 9% female.



Farm Products

Delaware County is dominated by corn and soybean production. These commodities are listed in the census under the category of 'grains, oilseeds, dry beans, and dry peas' which comprised 89% of agricultural sales ($112,220,000) in 2012. Within the category of 'grains, oil seeds, dry beans, and dry peas' corn accounted for $58,650,000 of sales and soybeans accounted for $51,039,000 in sales. Other products in the 'grains, oilseeds, dry beans and dry peas' category accounted for $1,883,000 in sales comprising 1.68% of revenue in this group (USDA, 2012e).



Fast Facts:

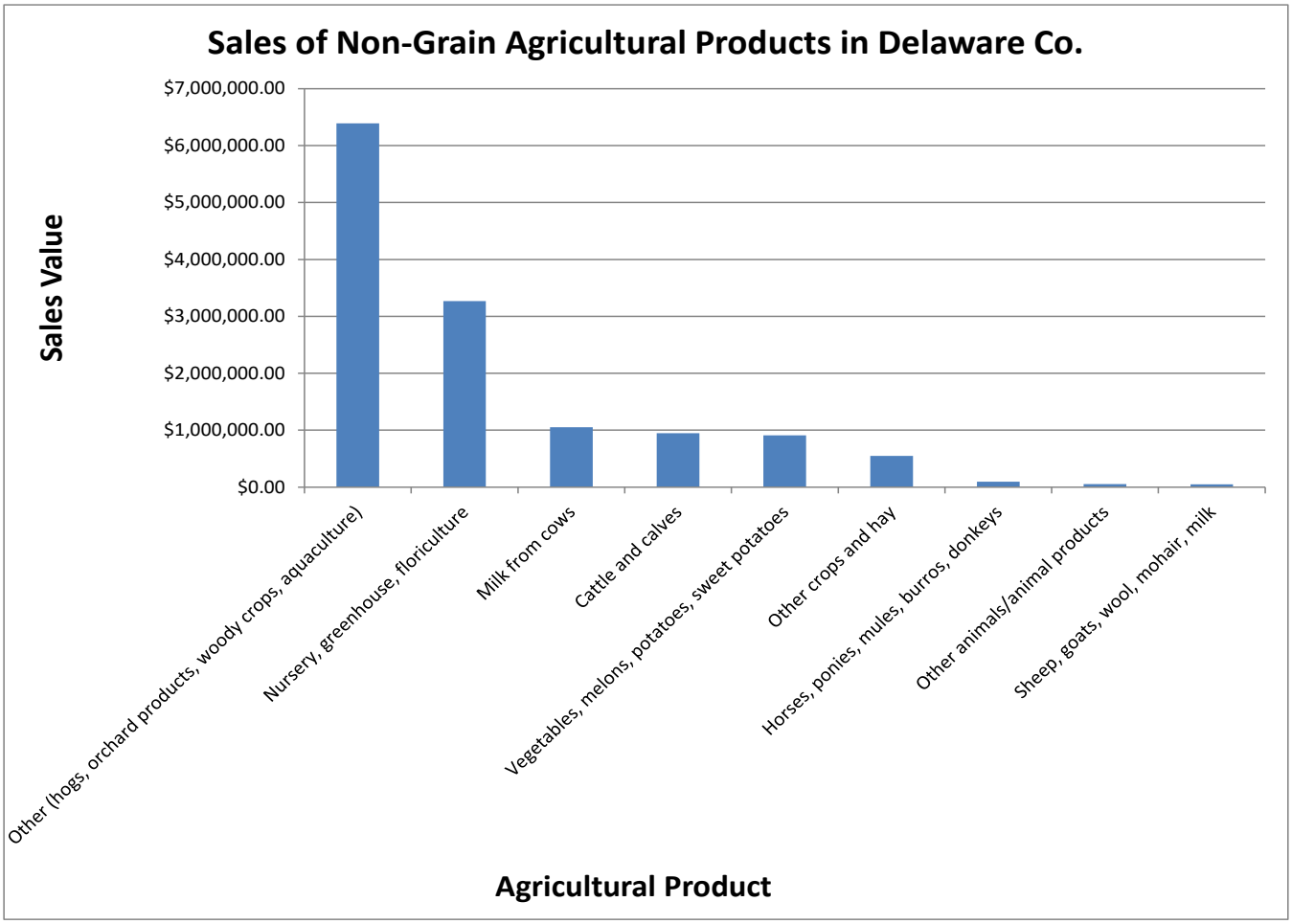
- Commodity crops of corn and soy make up approximately 88% of agricultural sales in Delaware County.
- Nursery, greenhouse, and floriculture products comprise the second largest identifiiable source of agricultural revenue (2.6%), followed by milk from cows (.84%) and cattle from calves (.75%) (USDA, 2012e).

Sales of Agricultural Products in Delaware County		
Commodity Group	**Value of Sales**	**% of Sales**
Grains, oil seeds, dry beans, dry peas	$112,220,000.00	89.38%
Other (hogs, orchard products, woody crops, aquaculture)	$6,392,000.00	5.09%
Nursery, greenhouse, floriculture	$3,268,000.00	2.60%
Milk from cows	$1,053,000.00	0.84%
Cattle and calves	$947,000.00	0.75%
Vegetables, melons, potatoes, sweet potatoes	$908,000.00	0.72%
Other crops and hay	$549,000.00	0.44%
Horses, ponies, mules, burros, donkeys	$95,000.00	0.08%
Other animals/animal products	$55,000.00	0.04%
Sheep, goats, wool, mohair, milk	$47,000.00	0.04%
Poultry and eggs	$26,000.00	0.02%
Fruits, tree nuts, berries	Data not given	
Cut christmas trees and woody crops	Data not given	
Hogs and pigs	Data not given	
Aquaculture	Data not given	
Total	125,560,000.00	

(USDA, 2012e)

Fast Facts:

- Following commodity corn and soy, nursery and greenhouse products are the second largest observable source of agricultural sales, comprising 2.6% of total ag. sales in Delaware County.
- Vegetables, melons, potatoes, and sweet potatoes account for less than 1% of total agricultural sales.
- Respective data for hog production, orchard products, woody crops, and aquaculture is unavailable, however these catagories combined make up approximately 5% of agricultural sales (USDA, 2012e).



(USDA, 2012e)

Note:

It is difficult to provide a complete report on sales of non-grain agricultural products because the data is partially unavailable. The US census does not report information that could be used to identify individual farms, therefore data in four categories - hog production, orchard products, woody crops, and aquaculture, has been withheld from publication. In combination, sales of the aformentioned products make up approximately five percent of total agricultural sales and accounted for $6,392,000 of revenue in 2012. Unfortunately, this report can not further identify sales in each of the four sectors where data has been withheld.

Local Farms: The Big Picture

East Central Indiana has the ability to produce more edible food for local consumption than it currently does, but historic precedent sees resources more commonly allocated toward commodity corn and soy. In 2012, a feasibility study was commissioned with a goal to "expand the marketplace for Indiana-raised and Indiana-consumed food" (Aubrey, 2012). Among other things, the study predicts that the market size in Central Indiana is not only large enough to accommodate more specialty crop producers, but that most of the anticipated growth in the specialty crops will come from farms of less than 200 acres. Consequently, the number of small, diversified farms is expected to increase. Overall, there seems to be a desire in Indiana to "grow more farmers," but there is also an inclination that some of the critical infrastructure needed to support this growth may be lacking in the state (Meter 2012).

In population terms, small farms are by far the largest segment of all U.S. farms and farms in Delaware County (USDA, 2012). Not only do they hold and manage a significant amount of the nation's valuable land and assets, making them critical stewards of our natural resources, but small farms also compose an important part of the social fabric of rural America by contributing to culture and tradition. Small farms "promote self-empowerment and community responsibility; provide places for families to pass on values of hard work and responsibility; and provide a human connection to food and the earth" (NCSF, 1998). Because small farms are more likely to practice and promote sustainable agriculture than large farms (D'Souza & Ikerd, 1996; Tavernier & Tolomeo, 2004), smallholder farmers will become especially important in supporting local food systems and maintaining the future viability of our agricultural land and natural resources.

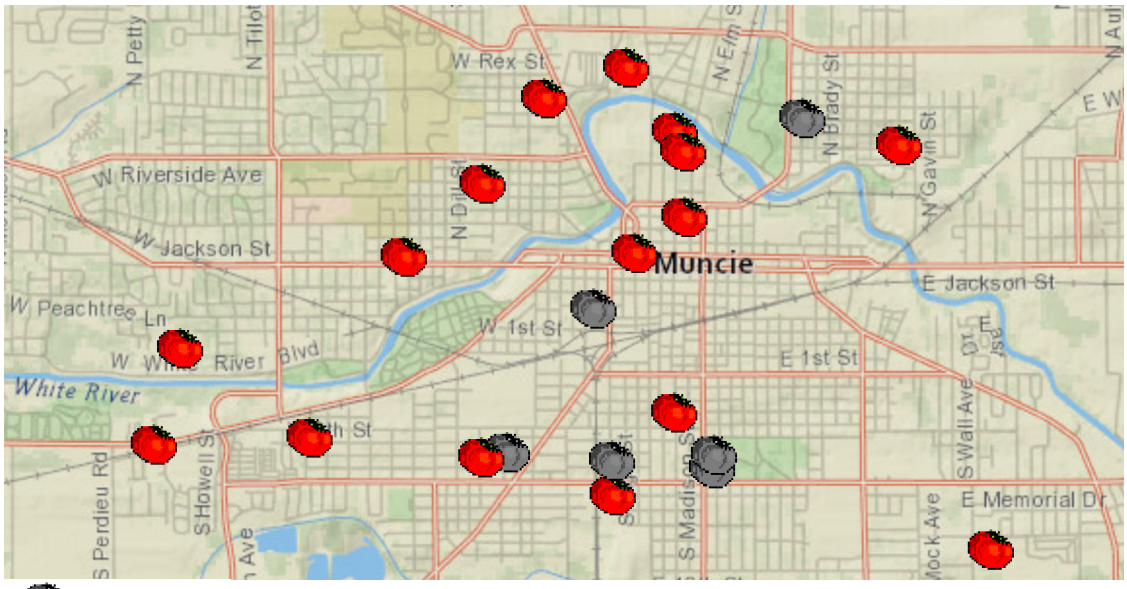
Little is yet known about the producers in ECI who are driving the engines of change in the local agricultural system. With attention to small farms growing at the state and regional levels to increase assistance, it is critical to understand the characteristics, motivations, and perceptions of small farmers within the ECI context in which they operate. A better understanding of the decision-making process for these producers will not only allow for the more efficient allocation of supportive resources, but will also provide insight into the relevant drivers for sustainable management and food system development in ECI. This food security assessment offers a preliminary glimpse of small farmer perceptions and barriers to expanded food production in section 4, 'What's the problem?' Further study is needed to identify and implement relevant support structures for ECI growers of edible crops.

Urban Gardens

Delaware County is home to diverse network of community gardens. At least 30 existing community gardens have been identified, with more becoming established every season. The gardens are created, managed, and maintained by a wide variety of entities including non-profit organizations, schools, churches, health providers, libraries, and individuals. Although each garden operates idependently, the Urban Garden Coalition (UGC) provides opportunities to collaborate toward common goals. Their mission is as follows:

> "The Urban Garden Coalition unites gardens, groups, and individuals in collaboration to build a stronger local food system. Remembering our region's heritage of neighborhood victory gardens and family farms, we draw on this collective strength to address food security challenges within our community. By promoting urban gardening in our region, UGC strengthens community networks, promotes healthy eating, encourages environmental stewardship, increases food system resilience, and empowers youth to plant the seeds of our future (UGC, 2018)".

Urban gardens have the potential to increase accessiblity to healthy, affordable produce. However, lack of information sharing among urban gardens is a barrier to collaboration. Further research is needed to better understand how urban gardens contribute to food system resilience, and what support structures could facilitate their effectiveness in increasing food security. A current map of urban community gardens is provided by the Delaware County GIS Department. To veiw the interactive version, visit the online map here.



Muncie's active and inactive community gardens (2018)

What's the problem?

Delaware County's Household Challenges

Methodology

The assessment of the challenges and barriers perceived by Muncie residents around food resource availability, accessibility, and utility was done by conducting focus group sessions and key informant interviews with a total of twenty-four study subjects, all of whom were involved to some degree in improving local food security and/or promoting a localized food system. Key informants included food pantry volunteers or employees, church leaders, a neighborhood council member, community garden coordinators, health-care service providers, a dietician, a city government employee, and educators.

First, two focus groups, with four community leaders each, were conducted. Participants were asked about their experiences, perceptions, and observations on the task of acquiring sufficient, nutritious food. After that, key informant interviews were conducted. Key informants were asked the same set of study questions as the focus group. Both, focus group participatns and interview participants were asked the following ten questions:

1. What does food access look like in your community?

2. What are your community's priorities when it comes to buying and using food? Is there a change in priorities that you would like to see? What would it take to shift these priorities in your community?

3. What does "local food" mean to you and your community?

4. Is there a disparity between the food desired and the food available in your community?

5. What obstacles does your community encounter in accessing healthy food?

6. What resources already exist to battle food insecurity?

7. What are the differences in food security in different parts of your community?

8. What else could be done to improve the community's food security?

9. Are there any local ordinances or other policies that affect food production, distribution, and consumption? Are there any transportation policies that affect food access?
10. Is there anything that hasn't come up that you think is pertinent or that you'd like to share? Who else should be included in this discussion?

Focus groups and key informant interviews were audio-recorded and each recording was then transcribed verbatim. Following a thorough read-through post-transcription, these interviews were then analyzed through a process of coding to allow the researcher to determine how the community members would like to see Muncie's food insecurity addressed. These individual codes were then collapsed into 8 barriers.

Barrier 1: Fresh, healthy food is desired, but absent

Subjects repeatedly noted the absence of high-quality food in Muncie, among low-income audiences as well as among financially stable audiences. A desire for locally sourced, fresh fruits and vegetables was the most widely expressed need across all audiences. Many subjects noted that the main source of locally or regionally grown produce is the Minnetrista farmers market, as well as a few other area farmers markets; these resources were praised, but concerns were raised regarding the short span of time these markets were open to the public.

"There is a disparity in amount of food but also type of food- they wish they had more healthy food." [Agricultural Educator]

"...there's more demand for produce than there is supply... This whole city is underserved for fresh food, even wealthy people, even if they have all the money in the world to spend on it, there's not a lot available. Downtown Farm stand and the farmers market do a good job but there are more people than there is food available." [Muncie Makers Market Vendor]

Several interview subjects felt that fresh, healthy options were being deprioritized in their communities in favor of less-healthy options.

"... I see Dollar Generals popping up like umbrellas. You just sit there and they are, like BOOM. 'Oh my god there's another Dollar General!' I wish that we did have something in place where if you're going to have those types of businesses, you can only operate if you provided fresh produce or something like that." [Delaware County's Head Start worker]

Consequently, as some interviewers pointed out, when a community wants food options that are unavailable to them, residents are forced to either accept food with which they are unhappy, or to travel elsewhere to find food.

"I have Ball State people who drive to Indianapolis to go to Whole Foods and stores like that... specifically because they want Whole Foods products they want Trader

Joe's products, they believe in the brands, they believe in organic, they believe in all sorts of things, and they like the variety, they like what is there, they like what's available…" [TeamWork for Quality Living worker]

Barrier 2: Fresh, healthy food is missing from communities.

The presence of one or more food deserts in and around Muncie was noted by most interview subjects; many spoke generally about the issue while other pointed to specific locations in need of better food availability. Muncie's downtown area was specifically identified as a food desert by several subjects.

"I think the real difficulty…is getting fresh food for our clients. Most of our patients live in the immediate area to this facility and there is limited availability of fresh food… There is nothing within a two-mile radius probably… To the South and to the East of this facility, there's really nothing particularly available year round as a source for healthy food for individuals." [Open Door Clinic healthcare provider]

"Having more services downtown that provide [fresh food] would really help. We have the farmers market at Minnetrista but that doesn't serve a lot of the community in need." [Grace Episcopal Church's soup kitchen volunteer]

Other parts of the community identified as being potential food deserts included the Whitely neighborhood as well as the East and South sides of the city.

"Whitely has been and really continues to be a food desert. The only available resources that people can walk to are the Dollar General store and the gas stations. They can't get any kind of fresh healthy food." [Whitely community council member]

"Most of the good stores are all clustered to the north of Muncie. Most of the other stores are too expensive or they don't have a produce section or refrigerated section. So once you move south of the river you're relying on corner stores, or the one Walmart, and if you're to the east of the south part of the city you're going to be four or five miles away from the closest store." [Suzanne Gresham Center healthcare provider]

Ultimately, rural food insecurity was also addressed by multiple interviews and focus group subjects, who noted the presence of multiple food deserts in the small county towns just outside Muncie.

"Albany has one grocery store and some restaurants, it's actually in better shape than some other communities…But then you go to Gaston and there's nothing. A

Dollar General…Eaton is kind of in between…Then you have Daleville- they're right by Highway 69 and have all those fast food restaurants. But they don't actually even have a Dollar General. They can't get a food store to come into town because Chesterfield has the Harvest Market, and Muncie has other grocery stores." [Purdue Extension Agent]

Barrier 3: Food is unavailable due to limitations

Identifying the forces that create food deserts and the causes of food unavailability is a daunting task given the many factors that determine food security. The focus group participants and key informants posed several theories, from the wide reach of the industrial agriculture system and the natural restrictions to Indiana's growing season; to the local issues of under-funded, limited emergency food resources and the closing of several area supermarkets.

"We are a farming community. But they're big farms- the farming that's not going to the people in the community for the most part. It goes to big companies that then process that food for whatever." [Edible Muncie member]

"People always say we need to produce more food, but if we would stop feeding the farm animals of the world- all the stuff you see growing in Indiana that makes us look like lush farmland, that's not for humans. It's for feed animals and other products. If we could fix that we'd have enough food for everyone." [Muncie Makers Market vendor]

"We have plenty of farms around, and when I go to the farmers market it's wonderful to see people bringing in all kinds of fresh food. Of course, it's very seasonally dependent." [Local pediatrician]

Just as seasonal limits to food availability were cited as issues in Muncie, limits to food resources' hours and days of operation were frequently referenced as a limiting factor to food security.

'Our food pantries are limited in what they are able to provide for families because the food bank is limited in what they are able to bring in the community…I believe [in] having a food pantry system…that was open more often, longer hours, or more hours in the day so that more people could access that pantry. But then also [having] volunteers that actually were able to come together to work those pantries." [Head Start program worker]

In addition to limits on farm-fresh produce and on emergency food resources, Muncie has recently seen limits imposed on residents' ability to patronize supermarkets. The closing of grocery stores in areas already limited in their food availability has resulted in a dramatic decrease to the food security in many of the city's communities.

"It did hurt when they closed the Marsh on MLK Jr. Boulevard and McGalliard. A lot of people shopped there, it was a good spot for East Side Muncie." [city employee]

"My colleagues at Teamwork, the people who participate in that program have seen a loss of a lot of stores and things near them and so they're definitely experiencing the desertification of Muncie as a place to find food." [TeamWork for Quality Living volunteer]

"There's not local food available- or even food available locally. The Marsh closed, the Kmart closed, so there's not even a good source of any food available." [Whitely Community Council member]

"You have a pocket on the East side where what a friend of mine referred to as "the poor people's Marsh"- it disappeared so they no longer have ready access to affordable food." [church pastor]

Barrier 4: Food must be affordable to diverse audiences

Overall poverty is an imposing hurdle for many Muncie residents to overcome in their search for food. With some of the highest poverty levels in the state, Muncie and Delaware County shoppers consistently seek out the least-expensive foods as possible.

"This East Central Region suffered a big economic downturn twenty or thirty years ago, and now the 2nd or 3rd generation of people have grown up in that environment… A lot of problems go away when you have money in your pocket… If I had the money in my pocket I have the transportation, and if I have the transportation I can get to the grocery store with the money in my pocket. Since I don't have it, then I've got all sorts of barriers to food." [Second Harvest Food Bank worker]

"There are still people that are just not able to access [food], especially if you have people that don't qualify for SNAP benefits because maybe they were one dollar or two dollars over the poverty threshold. You have this group of people who don't have access, because they don't qualify- but they kind of do." [Head Start employee]

The whole of Muncie School Systems also sees students struggling with poverty and hunger; a city worker explained that the majority of children enrolled in Muncie schools are from low-income families that qualify for a free or reduced lunch program.

"72% of the kids in Muncie schools are on free or reduced lunch, so they're getting food from the schools. But only some schools do that during breaks. But there is that concern that I'm sure parents have, where if there's a snow day, some kids don't eat. School districts have to consider that, they can't cancel school because 72% of their kids may not eat anything that day." [City employee]

A community volunteer with Edible Muncie summarized the city's poverty phenomenon when asked about whether food prices affect residents' food choices:

"Big Time. Absolutely. I think it's as cheap as you can get it and as much as you can get out of it. The bigger the size the better...is what we're looking for, because we don't have all that money in our pocket, so we have to use what we have in the best way we can." [Edible Muncie volunteer]

Barrier 5: Food must be accessible for all individuals

Like financial insecurity, the transportation insecurity was reported to be a significant problem for many people living in Muncie. Low or zero-access to vehicles leads residents to rely on public transportation, walking, or biking in order to acquire food.

"The Marsh closed, the Kmart closed, so there's not even a good source of any food available. And that's hard particularly with people who are shut-ins. We know there are certain families that need food brought to them. So part of the problem is transportation, both for shut-ins and for other people who don't have transportation reliably... Transportation is a major issue- getting people to food or food to people." [Whitely community council member]

"Food access [is] not a big stretch in some parts of the city, and in other parts of the city it's a very big stretch. I think there are pockets of population within a city where it's really a long reach, as you're describing. It's not a convenient path to travel. There's bus transfers, the distance that you have to walk, or those kind of things." [Second Harvest Food Bank worker]

"There are available options- we have Walmarts and Aldis on both sides of town. But if you're in a food desert and don't have transportation, then there's a total inability to get some of the foods you want." [Local dietician]

Barrier 6: Ability to acquire and use food in a timely manner

Focus group subjects from the Edible Muncie organization referred to the time-consuming nature of seeking food as a food insecure individual, stating that "being poor is hard work" and that patronizing food pantries to supply a whole family's food is a "full-time job." Many low-income and transportation-insecure residents of Muncie are familiar with this time commitment, and find it hard to fit into already-packed schedules and overwhelming life situations.

"Most of the clients we work with are limited resource audiences so most of the time they're focused on what they can get cheaply and easily. Most are just thinking about the moment and not planning ahead. Quick access to things is on the forefront for them." [Purdue Extension agent]

"[The priority] is convenience. Its 'what can I get to that is quick and fast,' 'what can I cook that doesn't take a lot of steps, that's not going to take a lot of time in the kitchen,' and things like that." [Head Start worker]

"Not everyone has the skills to be able to look at a cook book, pick everything that they need off the recipe, go to the store, find those items, then go back and prepare it. That's really time consuming." [Suzanne Gresham Center healthcare provider]

Barrier 7: People must have knowledge and tools to use food

Increasing the availability and access of nutritious food is an important aspect of improving food security; however, it alone does not guarantee that the food will make it onto the plates and into the stomach of the people who need it. As participants mentioned, ensuring that Muncie residents know how to prepare and eat the food, and have the tools necessary to do so, is a vital part of creating a healthier community.

"Back to what people are eating and why are they eating that, it's sometimes because that's how they were raised to eat. Some of it is generational, some of it is culture." [Motivate Our Minds employee]

"Having a place to store the food and knowing how to cook the food, these are always challenges." [TeamWork for Quality Living worker]

An Edible Muncie volunteer shared that Covenant Partners, a Methodist organization that provides food handouts, has specifically requested low-preparation, shelf-stable donations to best serve their clients.

"Covenant Partners has developed a list of what they would like to give everybody in the bag they give out- 2 cans of vegetables, two cans of tuna, pasta and a jar of spaghetti sauce, peanut butter and jam, and a box of corn muffin mix." [Edible Muncie volunteer]

Volunteers with the Friends Church food pantry explained that they are taking small steps to address this issue.

"People who come into the pantry don't always have a can opener. One of our volunteers keeps a little stash that she bought for a dollar, and sometimes she'll look at a person and ask discretely if they'd like a can opener." [Friends Church food pantry volunteer]

"A lot of people aren't going to have a good knife, or a cutting board, because those things cost money and many don't have that privilege. Even many privileged people don't have those tools, so how can you expect anyone who has no kind of luxury to have them? Just handing out the food and the recipes isn't always enough." [New Roots volunteer]

Barrier 8: People must feel motivated and empowered

In addition to giving Muncie residents the knowledge and tools to use locally sourced foods, people must be surrounded by a culture that leads them to choose those food items. Adjusting palates to enjoy whole foods, providing culturally relevant options, and removing stigma and taboos surrounding food insecurity are instrumental moves in improving the community's utility of food. Several subjects observed that a barrier to food security was that the modern American's palate was saturated with the sugar, salt, and fat from a processed diet.

"Initially what we found was that one, people couldn't afford local produce, so we took care of that. Two, people didn't know what to do with it, so we're taking care of that. But then even after all that pain, they still didn't like what they were tasting because their taste buds and their brains are so indoctrinated to like the bad food. We had to keep repeating that process, and it's so time consuming." [New Roots volunteer]

What's the problem?

East Centeral Indiana Producer Challenges

Purpose

In our efforts to help create a sustainable, inclusive, regional food system in Muncie and the surrounding counties, we thought it important to better understand the farmers who do and will play a significant role in providing healthy food to area residents. The following section is excerpted from a study done by Samantha Grover and Joshua Gruver in 2012 and 2013 and explores the barriers and challenges faced by local farmers as they explore market opportunities in the ECI regional food system (see Grover and Gruver, 2017). Past research regarding farmer decision-making has been inconsistent and has largely focused on the larger-scale, conventional farmer, leaving smallholders poorly understood. There is a need to better understand the management decisions of smallholder farmers within their regional context to promote efforts toward environmental, social, and economic sustainability (Grover, 2013). In our efforts to help create a sustainable, inclusive, regional food system in Muncie and the surrounding counties, we thought it important to better understand the farmers who do and will play a significant role in providing healthy food to area residents.

Methodology

This study employed qualitative research methods to explore the motivations, perceptions, and regional contextual factors that influence the management decisions of small-scale farmers in East Central Indiana (ECI). In-depth, semistructured interviews with 15 key informants (e.g., personnell from - Purdue extension, Farm Service Agency, Natural Resources Conservation Service, Indiana State Department of Agriculture, nd other similar organizations) and 29 farmers were recorded, transcribed, and coded using content analysis to understand the factors most relevant to small-scale farming in the region. Several important themes emerged related to perceived barriers to sustainable farm management, including markets; structures and regulations; time and labor; environmental/ ecological factors; and networking and access to educational support.

Farms were selected based on the following criteria, which are modified from the USDA definition for "low-sales, farming-occupation, small family farm:" a) farm controls fewer than 260 acres of land, b) a majority of farmland is operator-owned (i.e., not leased), c) ownership structure for the farm is individual or family-owned (related by blood, marriage, or adoption), d) annual farm revenues do not exceed $150,000, and, e) a significant portion of the farm's output is dedicated to crop or animal products, or both, destined for direct sales to consumers or local food markets (e.g., u-pick operations, farm stands, farmers markets, Community Supported Agriculture (CSA), local groceries or auctions). These criteria were meant to reflect current and predicted trends among smallholder farmers in the United States, and also include a focus on locally-marketed food production.
The results of this study are not intended to generalize the views of East Central Indiana (ECI) farmers, but rather, to enhance understanding of the context-specific factors that shape intention and behavior among smallholder farmers.

Results

Marketing became an exceedingly relevant topic throughout the farmer interviews. A related topic that emerged was KIs' views of the farming culture in ECI. Several speculated that ECI's history of the tradition and dominance of conventional agriculture may have stifled the growth of the small farm/local food movement compared to other areas in the state. While informants did not say precisely why ECI has been slower to adopt a local foods model than other areas in the state, several theories arose related to geography, economics, and the ubiquitous presence of conventional agriculture in ECI compared to other regions.

Barrier 1: ECI farmers markets are complex systems

Markets were by far the most prominent topic farmers discussed regarding challenges in maintaining long-term farm viability. Farmers perceived a relatively low level of awareness about local foods among consumers in ECI, although most said awareness had grown in recent years. Several were convinced that most people "don't know what good food is," noting changes in consumer preferences towards more convenience foods. They perceived a particularly low willingness-to-pay on the part of consumers in ECI compared to other areas in Indiana, as well as a lack of understanding of locally-based agriculture and the cost and processes associated with farming and food production. Several farmers in this study traveled to markets in the greater Indianapolis area, although somewhat regretfully. Farmers noted that the market was much larger in those areas and customers there seemed to have greater appreciation for local foods compared to ECI.

"The community here is just not—it doesn't have that mentality. They'd rather go to Wal-Mart or, you know… The mentality of the people here was—I don't know if they were just broke or what, but they just wanted to get something for nothing."

Farmers often pointed to larger-scale economic forces that affected the markets for their products. Many mentioned the economic recession in the U.S., although it was viewed to have both positive and negative effects on the market for local products. Farmers linked consumers' low willingness-to-pay to job losses and lowered incomes over the last several years, especially noting the decline of manufacturing industries in ECI.

Farmers were also attuned to the issue of market competition. In addition to discussing price competition from big box stores, many farmers also readily described competition with other local producers.

"The biggest challenge for me farming here has been to grow something that does very well, and that everybody else doesn't grow."

"Other farmers say, 'Well, I don't know how you can sell it at that price." And it's like, well, I don't compete with you. I don't live on your side of town. We don't compete with other vendors, and we don't compete with the grocery stores."

A number of producers mentioned the increasing presence of Amish populations in the small farming community over the last decade (Amish farmers were interviewed as well). Non-Amish farmers seemed to have a general respect for the Amish way of life and the quality of Amish produced products, but expressed concerns with market competition.
"non-growers."

"The Amish are going to be real competitors for anyone else because they are working hard at it–they're doing all the information gathering and research. And I wish them well, but I can't compete with them in price."

Farmers were further concerned about competition from "non-growers" (particularly those who sold products through farmers markets). According to farmers, some market vendors purchase food at lower prices from Amish-run produce auctions and resell it at farmers markets or roadside stands, with little or no indication to consumers of where the food came from. Several farmers openly described conflicts or contention with these "non-growers."

"It's not so much an open conflict as it is kind of a seething wound [laughs]. It's something that those of us that grow our own are very proud."

Some farmers seemed to view this practice as an issue of deception. They were indignant when comparing their own labor and investment spent in bringing their products to market to their "non-grower" counterparts.

"Every time they go and sell something they bought, they don't put no work into, we bring stuff home... It's a farmers market. If you aren't growing it, you're not a farmer. That's false advertisement, that's cheating."

Still, there was a range of acceptance for this type of market competition. While some were adamantly in favor of a grower-only model, others felt it was acceptable to engage in some resale, as long as vendors primarily produced their own goods. In fact, some producers engaged in resale as a way to supplement their own products to offer more to consumers, to increase their profit margins, and/or to have a source of backup income in the event of a crop loss; they felt it was simply another outlet to diversify the sale of their product and an important way to ensure a more stable income.

Another market-based issue was farmers' indication that supply chain costs for organic production are particularly high in the area. Since there is not a well developed organic sector in ECI, they said, it is difficult to access the inputs needed for organic production (e.g., fertilizers, feeds, approved pesticides, etc.), making the cost of organic production too high for many to justify. Producers cited that Indiana, and ECI in particular, has been slower than many other areas to embrace the local and organic food movement and believed that supply infrastructure had not developed accordingly for that reason.

Barrier 2: Inappropriate and/or unclear regulatory structure

Almost every farmer mentioned regulatory issues at some point during the interview. Many felt that small farmers were overburdened by excessive or inappropriate regulations at the federal and state level. For the most part, farmers felt that policies were enacted with large-scale operations in mind, feeling that many regulations were inappropriate to their scale, making the compliance process onerous—both time and cost prohibitive. Farmers also felt disadvantaged by government subsidy structures that favored large-scale production, noting that the system encourages cheap food, making it harder for small farmers to compete. Several felt that government "got in the way" of what they needed to do to be successful in operating and growing their farm.

"I don't like government intervention at all…(speaking of health regulations) It's a one size fits all rule that just simply doesn't fit me, and it wouldn't fit anybody else doing what I'm doing…"

Many farmers expressed concern over predicted changes in health and safety regulations. Farmers worried that any increase in certification or regulatory costs would hurt their already slim profit margins. Farmers also felt impeded by disjointed regulations at the more local level. Several mentioned that varied health regulations and other requirements from county to county, and even market to market, made the selling process confusing and time consuming.

Barrier 3: Time and labor constraints limit production

Nearly all farmers mentioned time, or lack thereof, as a constraint on their operations. Several worked full-time jobs on top of farming and struggled with expanding their operations or implementing new practices. While some aspired to leave their off-farm job to farm full-time, several farmers viewed what they do as a lifestyle choice that must be supported by an off-farm income. Yet, time was limited even for the full-time farmer. Many talked about challenges in becoming more efficient with all of their resources, but especially with their time. Those who farmed full-time often described struggling with being able to get everything done. Although general farm work was often discussed, several farmers also particularly noted struggles in finding the time to market products adequately or to learn about and set up new marketing avenues.

"I wish I had more time to focus on marketing, because with both of us working full-time outside of the farm, there are so many things that we want to do and need to do that there's just not enough hours in the day to get to them. I think if I could dedicate some more time to it, we'd see the changes and progress that we want to see sooner."

Farmers also discussed time in a more long-term sense. Many felt limited in what they could do with their operation because of their age, talking about the ways they might change their operation, "if they were younger" (a number of farmers did not begin selling extensively from their farm until retirement age). Many noted that the work is too hard to continue doing at the same rate as the body ages. Several farmers struggled with hiring labor to help ease their time constraints. For many, the cost of labor was too high to justify at their scale. Others struggled with being able to find workers who were able to do the work to their standards and stay long enough to become skilled at the job. Many farmers felt not only that "kids don't know how to work anymore," but some also worried that people in general may not have as much interest in farming as they used to.

Barrier 4: Difficulty implementing sustainable practices

Farmers identified the biggest positive aspects about farming in ECI to be the good soils and climate for growing crops (and, in fact, were are hard pressed to come up with anything else that was particularly positive about the farming region). Yet, farmers also felt that much of the land in the area was "tired" from conventional agriculture practices. Many criticized or commented on the use of crop rotations (or rather, lack thereof) as an example of the lack of agricultural diversity in the region. Several discussed struggles with maintaining and/or improving soil fertility, especially producers who were farming land formerly in conventional production.

"The land was in really poor shape when we got it, and it's taking a long time to build the ground back up. We realize it took a long time for it to get that way and it will probably take a long time to build it back up, but we would like for it to happen faster."

Several farmers also mentioned issues related to chemical drift as a challenge for growing organically. A few mentioned that even if they wanted to certify their farm organically, it wouldn't be possible because of their proximity to other conventional farms.

Barrier 5: Lack of access to networking opions and education

Farmers generally felt that their educational needs were underserved. Resources like Extension, they said, typically favored conventional farming. They especially felt that there was not enough information for growing horticultural crops in ECI soils and climate region, expressing frustration in seeking information online or from Extension, and only being able to find information catered to faraway places. Several felt that traditional educational resources were lagging in ECI.

"When you read and you go to conventions, you realize Indiana is really far behind in the fruit and vegetable business. Even your extension agents don't seem to be real proactive. Maybe there's not enough fruit and vegetable growers here? So you can't really fault them, but I just wish we could have a little bit more sometimes."

Some were frustrated with the available educational resources because they were "overly academic," feeling that educators did not have adequate hands-on training, or did not make enough site visits to understand farmers' situations. While some farmers felt positive about the support they received from educational agencies, many preferred learning from other farmers, or at least from those with hands-on experience.

"They've got the degree, but they haven't got the common sense knowledge. You can write a cookbook, but that doesn't mean you can cook."

Farmers often described learning from and receiving support from other farmers. Many found valuable relationships at various state or regional conferences, and found it helpful to talk to other farmers doing similar things.

"I think organizations where the members are willing to share information... those kinds of things are vital for a small farmer, especially a person that's trying to do it as an individual. It's kind of like your little mini support group."

At the same time, farmers seem to be disconnected from each other in the local ECI region. Few were able to describe many others in ECI who were doing similar things as them, and often farmers were only able to identify others farmers who attended their same market.

One farmer illustrated the relative rarity of his type of operation in the area by the "abnormal" nature of his practices compared to peers.

"I've been known to go to the dark side—organic fruits and vegetables... I'm doing strange stuff—which, for around here, strange means I try very hard to do no sprays or chemicals."

Some farmers perceived that there simply weren't very many similar producers in the area, while others figured that there were similar farmers were around, but they just weren't acquainted. One farmer mentioned her disappointment at the lack of a strong communal feeling among small farmers in the area.

"I feel incredibly isolated here. I know there a couple other people in our county, probably, but there aren't many small farms that are doing non-conventional farming."

Most farmers were open to the idea of a more formalized network for small farmers in ECI, although they expressed several concerns. The biggest concern was time—farmers worried that the benefits would not be worth the cost of time that could be better spent on the farm. Still, some had reservations because they were skeptical about the expertise of other farmers in such a group.

"Sometimes I get information from other farmers, but that's kind of like, take it with a grain of salt because you don't always know what they're really telling you."

On one hand, farmers found the knowledge gained from each other as an important resource. Several supported the idea of collaborating to share ideas and resources. Yet, several farmers thought there might be a limit to the degree that farmers in the area would be willing to cooperate to share resources and information.

"Not everyone's going to be your best bud, but the people who are reasonable and open hook up. There's people around here that are very competitive and secretive and guarding themselves all the time. I try to exercise my faith in those matters and realize that there'll be plenty for me."

Summary

Diversified crop farmers in ECI identified the following problems as significant barriers to their businesses and way of life: constricted market conditions; challenging dynamics in terms of trust and collaboration among each other; policies and regulations that hinder rather than promote their business; environmental concerns; and the lack of access to educational and monetary support. The extant literature on diversified smallholders across the nation suggest that these barriers are similar in different parts of the country (Gebremehdin, et al. 1996; Cantor, et al. 2009; Hall, et al. 2006; Eastwood, et al. 2004). Still, based on our conversations with our study participants, history, topography, local and regional economics, and culture are intrinsically tied to place and can affect a community's ability to adapt to new modes of production.

The ECI region's agricultural history and flat landscape have encouraged the continuing domination and expansion of production agriculture and the

underdevelopment of small-scale diversified agriculture relative to other areas of the state and country. Support and resources for diversified crop farms have also lagged behind, making it more challenging for farmers in the area to expand and improve their operations.

Concurrently, macroeconomic declines have disproportionately affected the ECI region. Low income and educational attainment and high unemployment in the area have contributed to lower consumer willingness-to-pay for fresh foods. Farmers have experienced weaker and more uncertain markets, further stifling the growth of small-scale, diversified crop farms and the local food movement. Weak markets in the region, at least in part, have detracted from farmers' willingness to form collaborations. All of these factors together support the notion expressed by many key informants and farmers that ECI is "slow to change."

If ECI is to progress toward a future including a more sustainable food system, the approach moving forward must be multi-faceted. Not only must there be efforts to educate consumers about the benefits of local foods and increase opportunities for diversified crop farmers to market and sell their products - we should work toward encouraging attitudinal changes on the part of farmers toward establishing more cooperative relationships among each other. This may help to alleviate some challenges, but will not make small-scale farming viable on its own. It is imperative to remove barriers that small farmers face to lower the cost of production and allow small farms to benefit from some of the economies of scale from which larger farms have benefitted for decades. Still, all of these steps must be accompanied by actively working to increase the size of the market by making locally based agriculture a productive and resilient sector of the economy.

A critical part of growing the local food economy will be to increase local food consumption in the ECI area. Many farmers travel to other regions, particularly more urban areas to sell their products resulting in food dollars leaving the more rural economy. Increased public education will help foster a community of collaboration and support among institutions, small-scale farmers, and individual consumers. Institutions have a particularly important role to play by supporting the growth of the sustainable food movement through purchasing relationships with local farms. In this way, important regional industries connect more with local and regional agriculture, providing a more stable and growing market for local foods, while encouraging dollars to stay in the regional economy and providing continuing support for area industries. Agriculture should be approached as an integrative part of economic development so that a strong economy will not be necessary to support local agriculture, but rather, that local agriculture will be a vital component of a strong economy.

What's next?

Delaware County's action items

What's Next? Recommendations for Delaware County

This report has outlined the state of food security in Delaware County and ECI including its challenges and opportunities for improvement. The following section will address recommended practices for bolstering and maintaining food security in the future.

It is clear that Delaware County and East Central Indiana face several food system barriers, however, there are many assets that may be mobilized in order to address these issues. The presence of numerous food-concerned organizations, higher education resources available through Ball State University, technical assistance from Purdue Extension, a network of thriving farmers markets, concerned health care providers, and a diverse base of growers and producers of local food provide a foundation of community strength to overcome the challenges that exist in our local and regional food systems. This work is already underway. Based on the accumulated data demonstrating existing needs and resources, Muncie Food Hub Partnership makes the following recommendations toward strengthening the local food system, which are later discussed in this section.

- Nurture continued collaboration among food-concerned organizations.
- Develop support programs to eliminate food insecurity.
- Invest in local food growers, entrepreneurs, and businesses.
- Mitigate transportation barriers to increase access to healthy, local food.
- Empower consumers through food literacy education.
- Continue food system research with evaluation of existing projects to inform best practices and future efforts.

Nurture Collaboration Among Food-Concerned Organizations

Some of the groups working to alleviate food insecurity have already been discussed, and there are many others still. Though each of their objectives is community focused and addresses residents' needs, unifying these efforts, or at least creating a network of concerned groups, could strengthen their impact through resource sharing and administrative support.

One effort to bring concerned groups and individuals together is the Annual Local Food Summit. As of 2018, there have been two local food summits gathering community leaders and other concerned residents for a full day conference discussing local issues and featuring plenary speakers. The summit also offers attendees the chance to participate in breakout discussions around various topics such as local food councils and community gardens.

Dr. Joshua Gruver, Local Food Summit organizer

While the summit does a good job of rallying participants and generating enthusiasm for food security issues, more coordination is necessary to unite groups during months outside of the conference. Email lists, a central website, a text list, a or a periodical newsletter could help keep participants connected and alert to new action opportunities during the rest of the year. A directory is currently curated by the Muncie Food Hub Partnership and should be evaluated for how to effectively stay in contact with concerned players. Social media could play a key role in facilitating continual connection.

2016 Local Food Summit participants Sara Niccum and Emlly Hart

Another effective way to increase advocacy and connectedness between food security issues and local officials is the development of a local food policy council. Cities, towns, and municipalities across the U.S. are developing food policy councils.
Bloomington, IN established a food council in 2011 to "assess the local food system, educate the community on food issues, and advocate for a healthier food system" (from the Bloomington Food Policy Council website). The council was made of expert food security advocates from existing community groups like the Local Grower's Guild and food pantries. The Bloomington Food Policy Council advocates not only for food security for all residents, but also for sustainability by incorporating local food resources to meet the food gap.

The Muncie and ECI community would benefit from the expert guidance of a food policy council. According to Purdue Extension, local food councils serve a vital role by supporting the following:

- Collaboration with community leaders and experts in various agricultural fields
- Connection to government policymakers
- Lobbying manpower for soliciting change

- Access to support (social, economic, etc.) for idea implementation as necessary
- A medium for voicing needs, values, and concerns
- An opportunity to discuss pressing issues and receive feedback about current initiatives, often directly from the source (Purdue University, 2018)

Each council is unique, and the regional committee for ECI would establish its own mission and bylaws to advocate for the communities needs. Members of the council could rotate periodically to ensure that current and diverse perspectives are incorporated in decision making. The most important function of the council would be its role in affecting local policy. A consistent body of experts would have significant influence with local government to advocate for policies that improve and protect food security. The creation of a local food council is a necessary next step to strengthen the local food system in ECI.

Creating a Food Charter for Muncie and/or ECI is a good inital first step for a food policy council. A Food Charter provides a framework (driving vision, action, and strategy) for civically engaged food systems. The Charter is a useful tool highlighting what local government can do to stimulate access to healthy foods for all.

Develop Support Programs to Eliminate Food Insecurity

Food insecurity is a systemic problem in Delaware County. Governments and community leaders who prioritize the health and safety of posterity should strive to create programs and infrastructure that ensures residents have the information and resources they need to access enough food. Environmental support is necessary to implement these solutions effectively. Municipal government should play an active role in revitalizing the local food system by working closely with the food council to assess existing food policy and make appropriate and community supported changes; creating a strategic plan for our local food system; partnering with community organizations on grant proposals that promote local food; advocating for state and national resources; and collaborating with non-profits to address food security barriers.

One non-governmental resource that proactively supports food security is Second Harvest Food Bank and their network of pantries, soup kitchens, and institutional partners. A long-term focused program of Second Harvest is their school pantry initiative, through which teachers and school staff are connected with families at an after-school food distribution. The objective for this program is to facilitate relationship building opportunities so that students and families might feel more connected to their school. Building trust between families and schools has the long-term impact of improving school performance by increasing student comfort in the schools. This is one example of using food as an avenue to improve future outcomes for residents and families. Fresh Directions and its parent organization

have similar objectives, to improve community resilience through food-based initiatives.

Finally, introducing and expanding incentive-based programs like Michigan's Double-Up Food Bucks would encourage benefit recipients and low-income residents to buy specifically healthy food to maximize their food dollars. This program allows SNAP recipients to double the value of their benefit dollars at participating Double Up locations. In addition to doubling the amount of healthy food residents are able to buy, residents have the opportunity to improve their health through access to quality food, which could decrease an individual or family's future medical costs.

Invest in Local Food Growers, Entrepreneures, and Businesses

ECI and Delaware County are agricultural powerhouses, yet most of that energy and economic investment is focused on commodity crops for export. Agricultural support programs such as the Farm Bill have tended to favor large-scale operations and promote dependence on corn and soy. Encouraging the redirection of some of these resources toward the local food sector would create greater food security in the region by diversifying the supply chain and reducing dependence on agricultural imports for food.

Communities that have invested in supporting growers of edible crops and producers of local meat, dairy, and value added products see economic multiplier effects across the community, as well as an enhanced quality of life and place. To encourage farmers to grow edible crops, local food supporters must strive to create a climate in which producers have viable avenues to sustained profitability. Producers at the 2016 Local Food Summit reported that the following actions would help create an economic and cultural environment favorable to local food production.

Recommendations from local producer stakeholders:

- **Cultivate a community of reliable buyers.** Food-concerned organizations and institutions must work with farmers to open sales avenues with consistent transaction strategies that communicates desired products, quantities needed, and production timelines. Support from a third party organization would be useful in coordinating these communications.

- **Facilitate access to increased infrastructure for farmers and entrepreneurs.** Inability to access facilities for processing, cold storage, food preparation, inventory management, and preservation are barriers to local food producers in East Central Indiana. Development of critical infrastructure with attention to affordability and accessibility for new growers and entrepreneurs would help remove barriers to entry into the local food sector.

- **Facilitate increased access to local food for consumers.** Development of multiple market locations, dates, and times for consumers to purchase local goods would help expand market share of local products and food security in general. Additional supply chain enhancements such as multiple distribution networks, ability to use food assistance benefits, and solutions to transportation obstacles would remove common barriers to consumer retail access. Paramount to increasing consumer reach is balancing affordability of local products and fair prices offered to producers.

- **Empower consumers to cook with local food through education and food literacy resources.** Awareness of seasonality, food preparation techniques, market dates and locations, and the values associated with local food are key knowledge elements that enable consumers to make use of local food products. Health, nutrition, and agriculture-concerned organizations should coordinate efforts to make these resources widely available.

- **Explore development of online technology platforms**. Local growers struggle to find software resources that fit their specific needs as farmers. Development of technology platforms that track production inputs/outputs, inventory, customer orders, billing, and distribution are required.

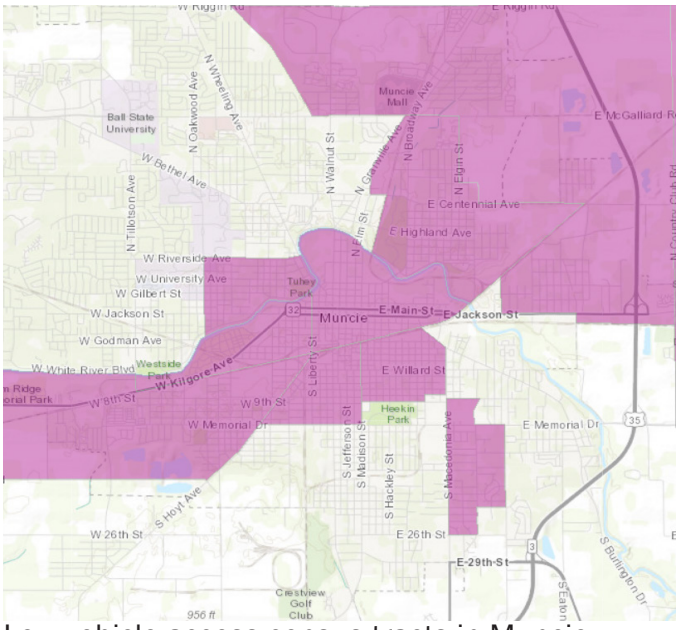
- **Provide labor support and training through partnerships with educational institutions.** Local food production must be carried forward by a new generation of growers and entrepreneurs. With the average age of principal farm operators hovering at 60, the time is now to educate and train young professionals in the local food sector. Educational institutions such as Ball State University and Ivy Tech are well positioned to support this initiative by creating and expanding internship and apprenticeship programs with aligned departments.

- **Facilitate access to funding and capital for scaling up.** Expanding food production operations beyond direct-to-consumer sales can be a huge barrier for local producers. Costly infrastructure, staffing, and equipment and processing needs can prevent farmers and entreprenures from growing their enterprises. Support in applying for grants and loans, technical assistance in obtaining certifications, consultation for meeting requirements of the Food Safety Modernization Act, and access to affordable infrastructure support (e.g. cold storage, processing, packing, and distribution) will remove barriers to expansion. Additionally, the creation of 'stepping stone' markets that provide access to flexible sales opportunities as producers scale up will provide an easier path.

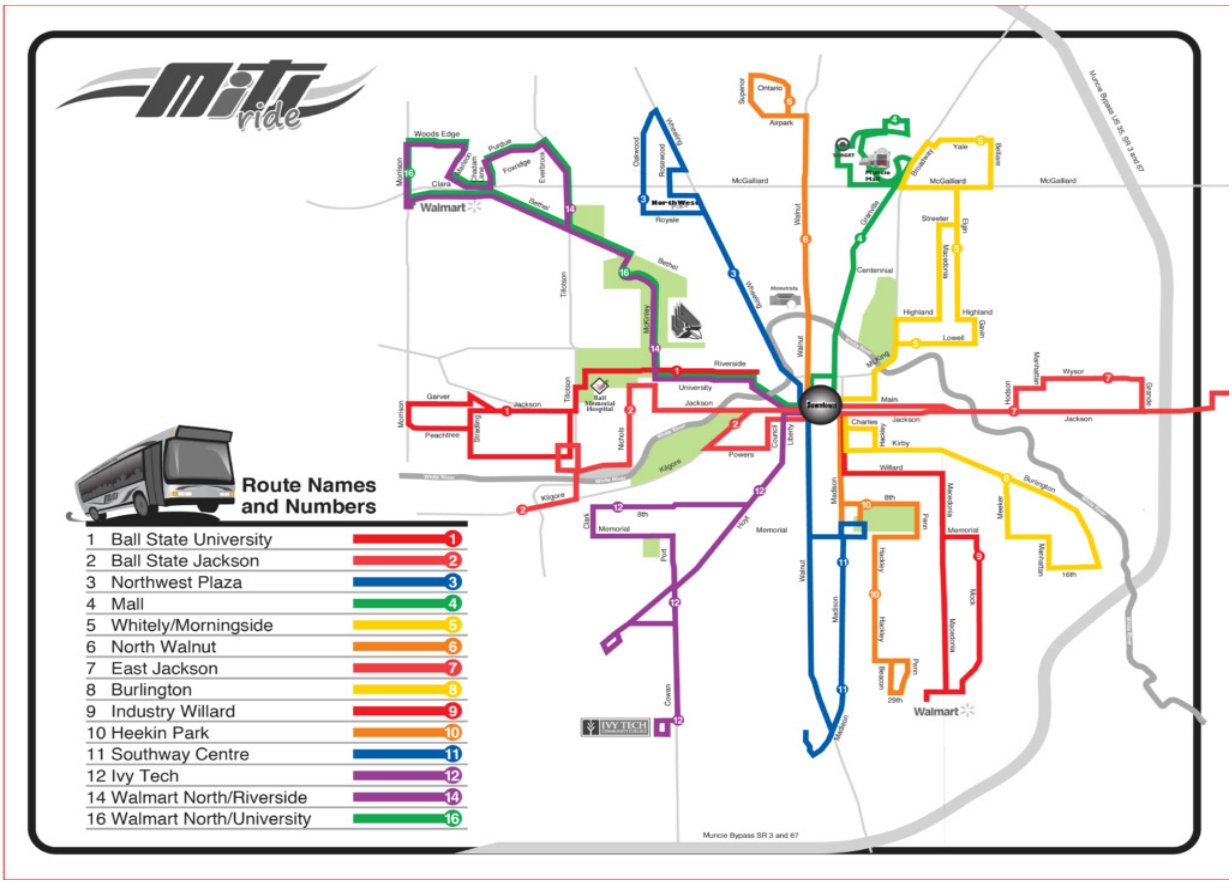
- **Provide regulatory clarity, supportive policy, and opportunities for stakeholder input.** Local government must work with regional producers to provide clear guidance regarding county health code compliance. Confusion regarding code interpretation and application is a significant barrier. Assistance navigating regulatory environment and efforts to create local-food supportive policy initiatives at the county and state level would mitigate these barriers. Additionally, stakeholder input through a local food council would inform the development of wise policy.

Mitigate Transportation Barriers to Healthy Food

Transportation complications are a significant barrier to accessing groceries and preparing meals at home. Ten census tracts in Muncie township are designated as "Low Vehicle Access" by the USDA's Economic Research Service, meaning that over 100 households within each tract do not have access to a vehicle and live further than 1/2 mile from the nearest supermarket (USDA, 2017a). Public transportation is therefore a critical resource for thousands of residents to obtain food. Muncie Indiana Transit System (MITS) buses provide high-quality and affordable transportation, yet barriers such as luggage restrictions, limited route paths, hours of operation, and travel time can prove insurmountable to those in need of food access.



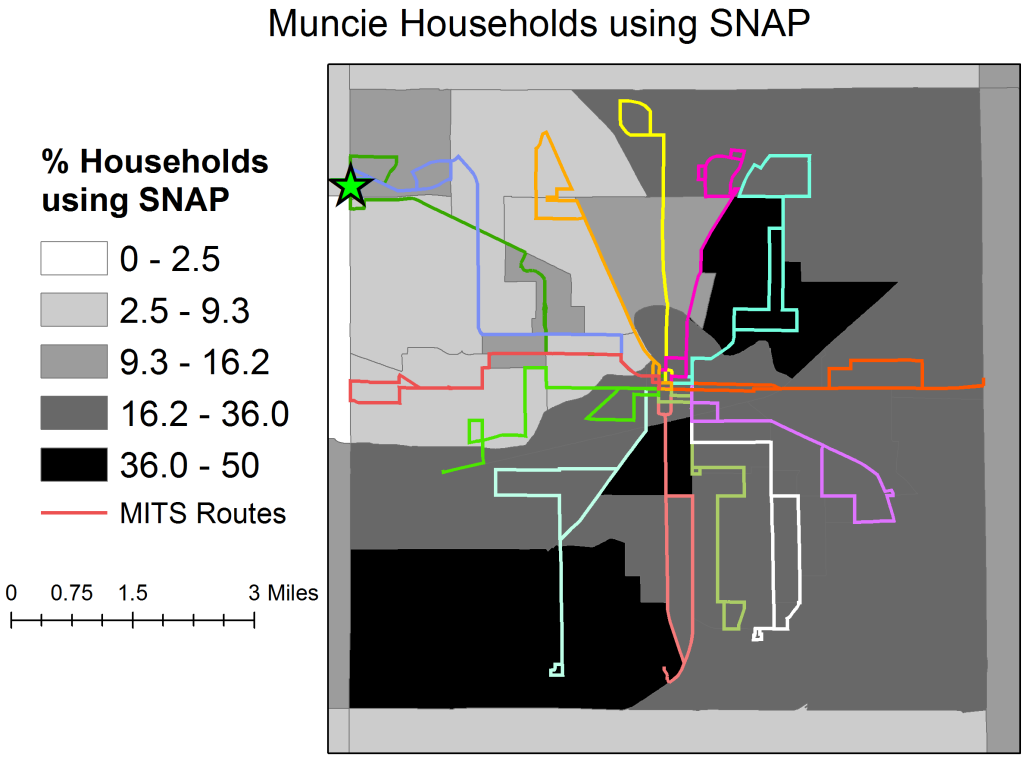
Low vehicle access census tracts in Muncie



MITs route map with popular destinations

One local group, Edible Muncie of Delaware County, has implemented a program to help low-income residents transport groceries using the public bus system. Bus rules restrict passengers to transporting only items on the bus that they can safely carry in one trip, excluding loose items and bags that may sit on the floor or in nearby seats. To mitigate these restrictions, Edible Muncie developed a shopping cart sharing program so that passengers may carry their groceries in a foldable, wheeled cart that holds a large insulated bag for groceries. The fleet of 16 carts are distributed between four low-income housing developments around Muncie.

While this effort will greatly help residents transport a supply of fresh groceries to their homes, it does not affect the limited ability of regional public transportation to connect food insecure people with the provisions they need. Restricted routes and the need for multiple transfers increases trip time which residents could otherwise use to work or care for their families. Therefore, the bus route infrastructure should be reevaluated to account for transportation's role in regional food security. This could be facilitated by a local food council and other community representatives.



MITs route map with household SNAP usage by census tract

Mobile food markets are another possible solution to transporation barriers preventing food access. The relatively low start-up cost, mobility, and flexibility of operations make these enterprises an attractive and feasible option for entrepreneures and concerned organizations to explore. Tree Hill Farms, a local vertically integrated farming and retail business, launched the first mobile food market to operate in Delaware County in 2015.

Tree Hill Farms mobile produce market, Flavor Fresh

Other mobile market concepts are currently being developed by private and public sector operators alike. They have the potential to offer numerous benefits including:

- Increased food security through expanded sales locations of affordable, healthy fruits and vegetables to residents in Muncie and Delaware County;
- Expanded market outlets for area farmers and entreprenures through prioritized sourcing of locally produced food products;
- Opportunities for increased food literacy through dissemination of nutrition education materials such recipes and cooking demonstrations;
- Accessible avenues of business development and training for aspiring entreprenures in the local food sector;
- Potential to build social capital through the creation of neighborhood focal points for food-related discussion and information exchange

Empower consumers through food-literacy education

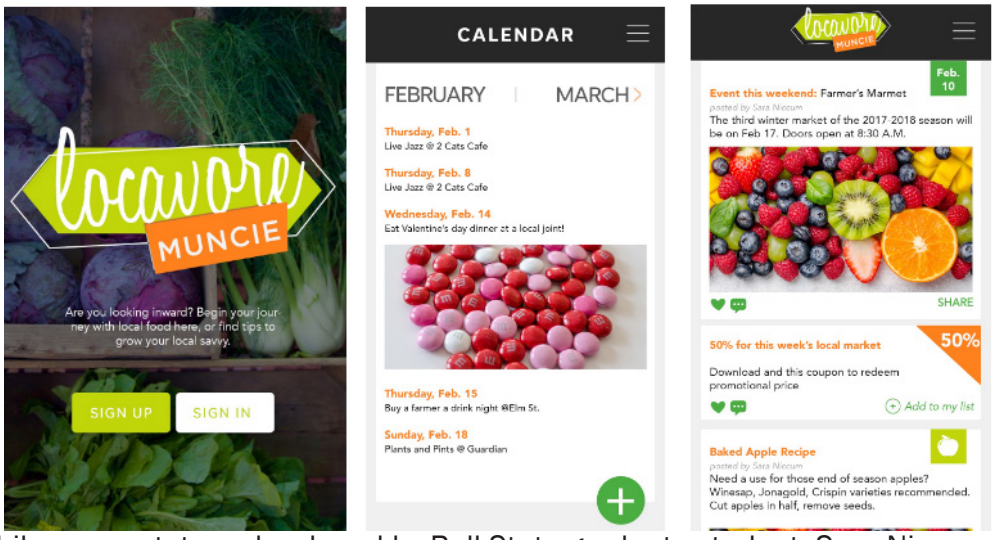
The role of education is multifaceted in boosting the food security of an area. Residents who are empowered by knowledge can develop creative solutions for meal planning, food access, and information sharing with others in their community. Information about nutrition and food preparation has long been distributed by Purdue Extension, hospitals, and other health and wellness advocates to help residents and patients be healthy. But there is still a need to educate residents about opportunities for food access including assistive resources and programs that will help families acquire food or other information they may need to ensure their family's wellbeing.

Educating citizens should be a primary goal of all food security advocates, and many community groups have already taken on that objective. Harvesting Hope is using anecdotal stories and recipe sharing as a form of journalistic outreach to the general public and a way for residents to exchange personal knowledge about favored dishes and foods. Their website also houses links to food pantries and other assistive resources. Edible Muncie did significant outreach to help residents access food assistance. The group, before they dissolved in 2017, kept an updated list of dates and times for food pantries, food distributions, and education opportunities through Purdue Extension or other providers such as Open Door Health, IU Health, and local school corporations.

Micheal O'Donnell (Purdue Extension) hosts a tour of his family farm

Fresh Directions, a program of Inside Out, also does some educating through their social media channels by sharing the healthy creations they make with rescued ingredients. Using these well-known channels will be increasingly important for education outreach as food insecure people often do not have time to onboard and do additional research to familiarize themselves with new platforms and information outlets. Having quick, easy access to information through social media or a text subscription service can quickly provide updates to food insecure individuals to meet their needs. The more accessible educational information is, the more people will be able to find it and share information with others to become a food security advocate.

One possibility for exploration is a mobile app. An app would provide effective access opportunities because it offers quick updates and notifications that can be tailored to a user's preferences. Subscription opportunities through an app could enable users to see regular updates from resources they visit regularly or hear about new opportunities at nearby locations. Because an overwhelming majority of adults are smartphone users, this is a reliable way to deliver food news to them.



Mobile app prototype developed by Ball State graduate student, Sara Niccum

Continue food system research

Lastly, continuing assessment is necessary to track changes in the local food system landscape. Research must continue to evaluate the impact of local food initiatives, assess changing needs, and develop recommendations for future efforts. This assessment provides a first step in creating a foundation of information about the local food system in Delaware County and ECI, yet further future efforts will be needed to close significant information gaps. Educational institutions with the resources to conduct research should continue to explore local food systems, completing the picture of our community and illuminating changes over time. Ball State University, Purdue Extension, and Ivy Tech are well positioned to support this effort.

Appendix

I. Works Cited
II. Maps

I. Works Cited

Aubrey, S. (2012). Indiana Farms, Indiana Foods, Indiana Success: Central Indiana Food Hub Feasibility Study. Prosperity Ag & Energy Resources.

Bloomington Food Policy Council. (2016). Bloomington Food Policy Council. [website]. Retrieved from http://www.bloomingtonfpc.org/

Cantor, A., and Strohlic, R. (2009). "Breaking Down Market Barriers for Small and Mid-Sized Organic Farmers." California Institute for Rural Studies Report.

Cohen, B. et al. (2002). Community Food Security Assessment Toolkit. United States Department of Agriculture. Economic Research Service. E-FAN-02-013.

Delaware County GIS Department. (2018). Muncie Neighborhoods. Online Interactive Map Gallery. Retrieved from http://www.co.delaware.in.us/department/?fDD=25-0

D'Souza, G., and Ikerd, J. (1996). Small Farms and Sustainable Development: Is Small More Sustainable? Journal of Agricultural and Applied Economics 28.1: 73-83.

Economic Research Service (ERS), U.S. Department of Agriculture (USDA). Food Access Research Atlas. Retreived from https://www.ers.usda.gov/data-products/food-access-research-atlas/

Gebremedhin, T., and Christy, R. (1996). Structural Changes in U.S. Agriculture: Implications for Small Farms. Journal of Agricultural and Applied Economics 28.1: 57-66.

Grover, S. (2013). Exploring Motivations and Perceptions of Small-scale Farmers: Considerations for Sustainable Agriculture in East Central Indiana. Graduate thesis.

Grover, S., and Gruver, J. (2017). "Slow to change": Farmers' perceptions of place-based barriers to sustainable agriculture. Renewable Agriculture and Food Systems, 32.6: 511-523. doi: 10.1017/S1742170516000442.

Hall, C., Brooker, J., Eastwood, D., Epperson, J., Estes, E., and Woods, T. (2006). A Marketing Systems Approach to Removing Distribution Barriers Confronting Small-Volume Fruit and Vegetable Growers. Choices 21.4.

NCSF (National Commission on Small Farms). (1998). A Time to Act: A Report of the USDA National Commission on Small Farms. Washington, DC: United States Department of Agriculture.

Meter, K. (2012). Hoosier Farmer? Emergent Food Systems in Indiana [Case Study]. Minneapolis Crossroads Resource Center.

Miller, Thomas P. (2015). Food Hubs Feasibility Study. Indiana State Department of Agriculture. Retrieved from https://www.in.gov/isda/files/Final_ISDA_Food_Hubs_Study_(May_2015).pdf

Massachusetts Institute of Technology. (2018). Living Wage Calculation for Indiana. [website]. Retrieved from http://livingwage.mit.edu/states/18

Purdue University, Purdue Extension. (2018) Food Councils. website]. Retrieved from https://www. purdue.edu/dffs/localfood/communityfoodsystem/food-councils/

STATS Indiana. (2015). Delaware County Indiana. [Data table]. Retrieved from http://www.stats.indiana. edu/profiles/profiles.asp?scope_choice=a&county_changer=18035

Tavernier, E., and Tolomeo, V. (2004). Farm Typology and Sustainable Agriculture: Does Size Matter? Journal of Sustainable Agriculture 24.2: 33-46.

U.S. Census Bureau. (2017). 2017 NAICS definition: 445: Food and Beverage Stores, Grocery Stores, Supermarkets and Other Grocery (Except Convenience Stores), Convenience Stores, Pharmacies, Gas Stations. Retreived from https://www.census.gov/eos/www/naics/2017NAICS/2017_NAICS_Manual.pdf

United States Census Bureau. (2016a). 2016 ACS 1-Year Supplemental Estimates with a Population Threshold of 20,000 or More. U.S. Census Bureau, 2012-2016 American Community Survey 5 Year Estimates. [Supplemental Tables].

United States Census Bureau. (2016b). Poverty Status in the Past 12 Months. U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates.

United States Census Bureau. (2016c). QuickFacts: Delaware County Indiana; United States. U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

United States Census Bureau. (2015). Selected Economic Characteristics. 2011-2015 American Community Survey 5-Year Estimates. [Data Table]. Retrieved from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

United States Department of Agriculture. (2012a). County Profile: Delaware County Indiana. [PDF]Retrieved from https://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Indiana/c18035.pdf

United States Department of Agriculture. (2012b). County Summary Highlights. [Table 1]. Retrievedfrom https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_001_001.pdf

United States Department of Agriculture. (2012c). Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2012 and 2007. [Table 8]. Retrieved from https://www.agcensususda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_008_008.pdf

United States Department of Agriculture. (2012d). Harvested Cropland by Size of Farm and Acres Harvested: 2012 and 2007. [Table 9]. Retrieved from https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/t18_2_009_009.pdf

United States Department of Agriculture. (2012e). Market Value of Agricultural Products Sold Including Direct Sales: 2012 and 2007. [Table 2]. Retrieved from https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_002_002.pdf

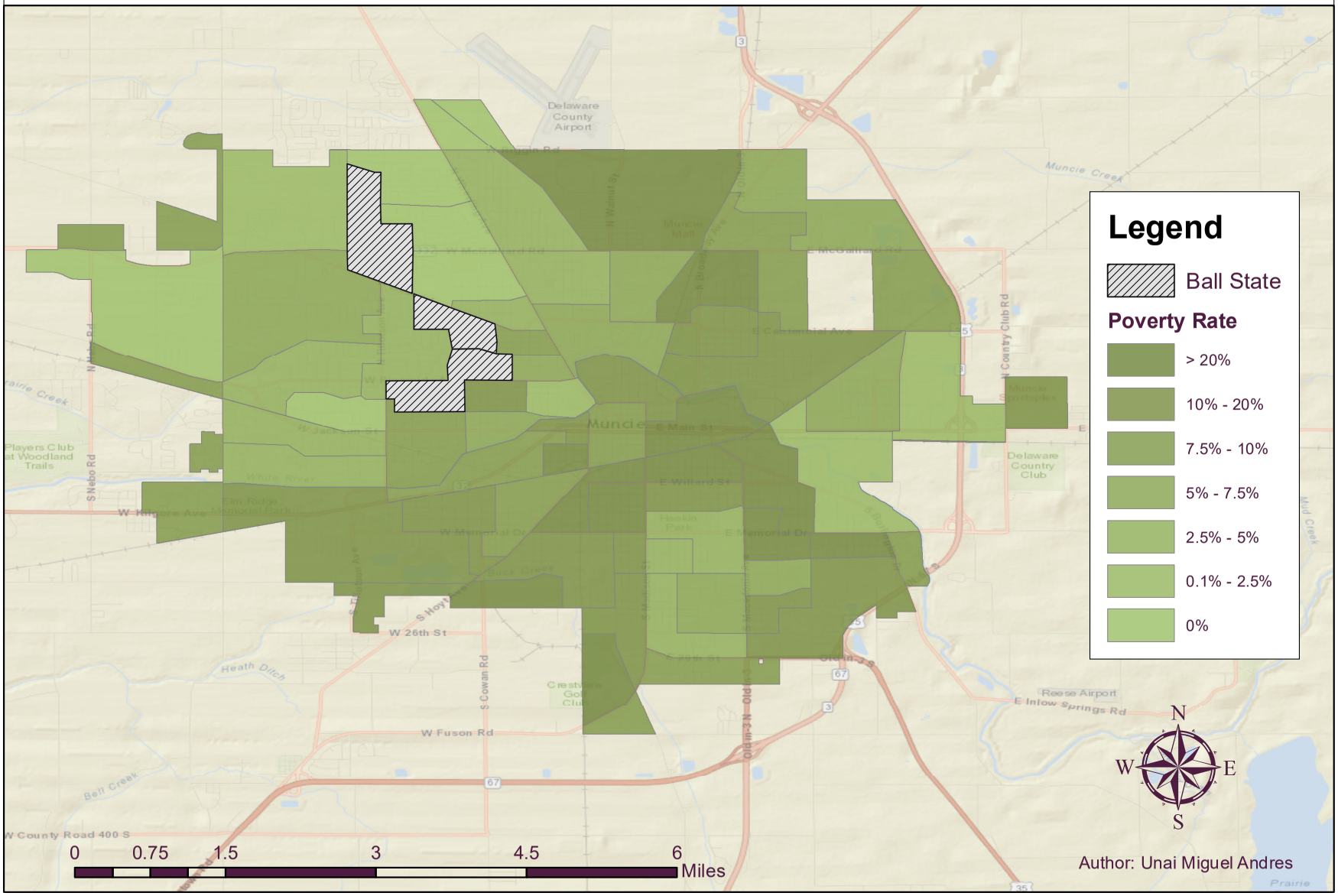
United States Department of Agriculture. (2012). Small Farms. [ACH12-34/September 2016] Retrieved from https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/SmallFamilyFarms.pdf

United States Department of Agriculture. (2015). Farm Typology. [AC-12-S-10]. Retrieved from https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Typology/typology13.pdf

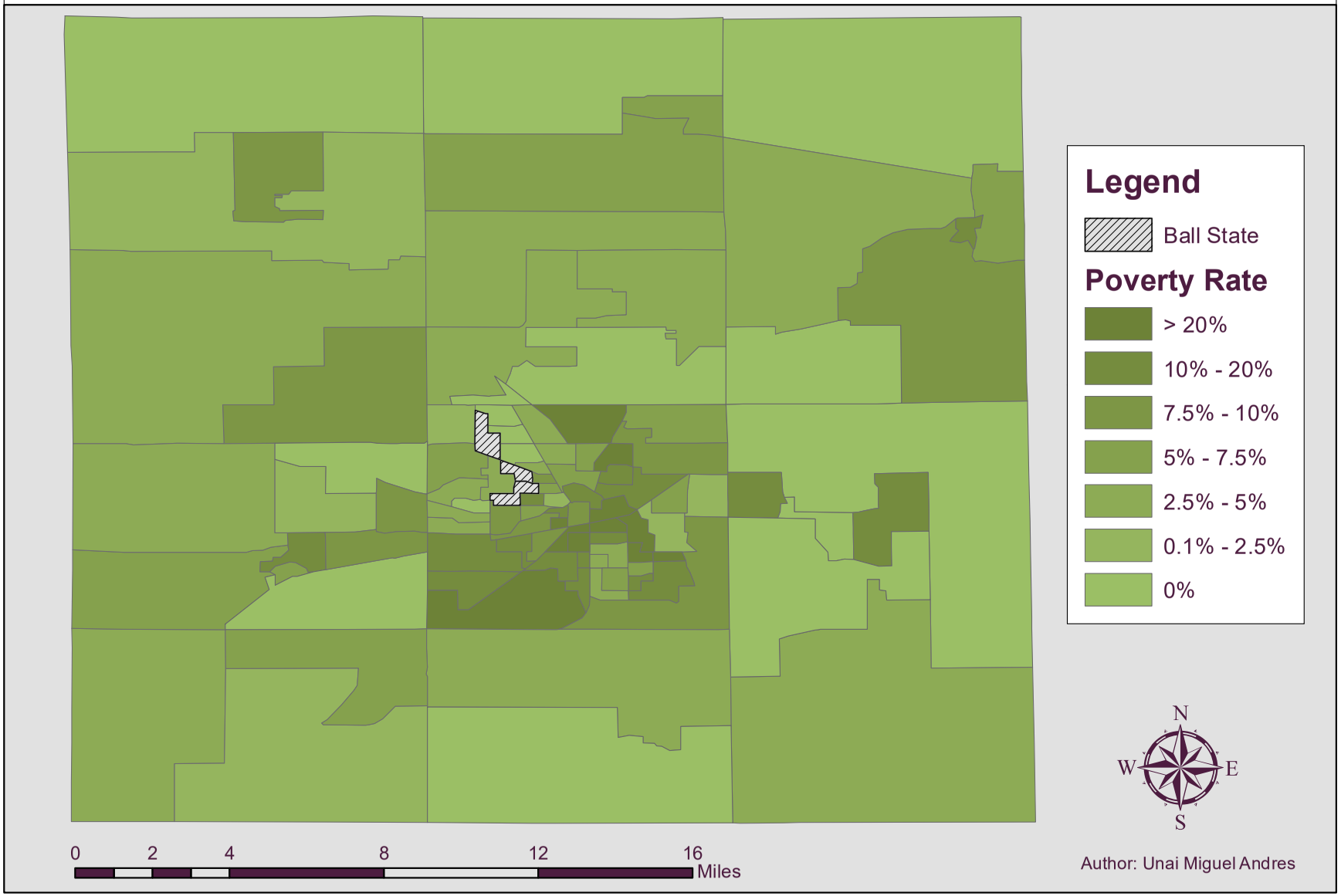
United States Department of Agriculture. Economic Research Service. (2017). Farm Household Wellbeing. [website]. Retreived from https://www.ers.usda.gov/topics/farm-economy/farm- household-wellbeing/glossary.aspx

World Health Organization. (2018). What is Food Security? World Food Programme. [Website]. Retrieved from https://www.wfp.org/node/359289

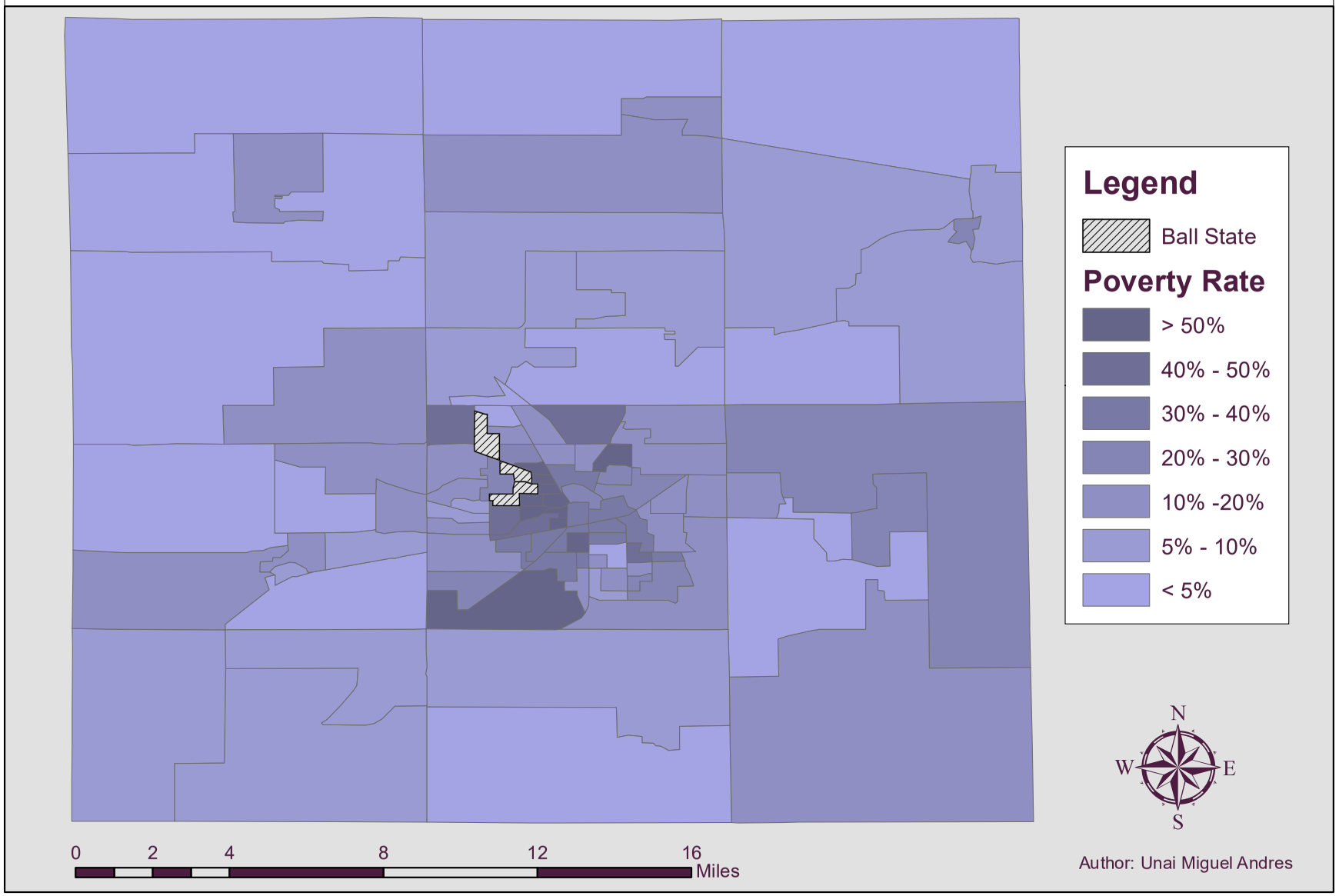
Muncie Socio-demographics: Poverty Rate in Family Households



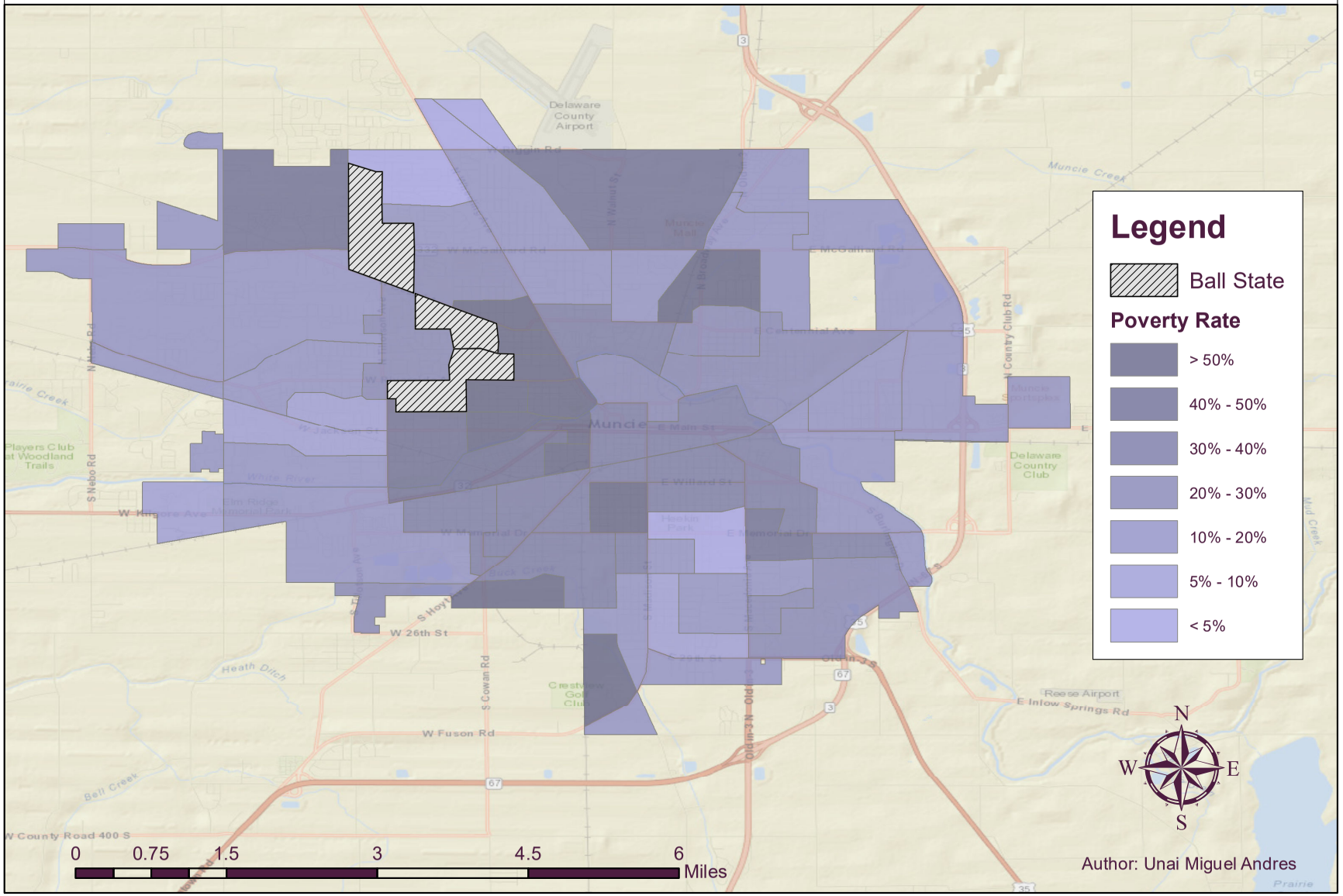
Delaware County Socio-demographics: Poverty Rate in Family Households



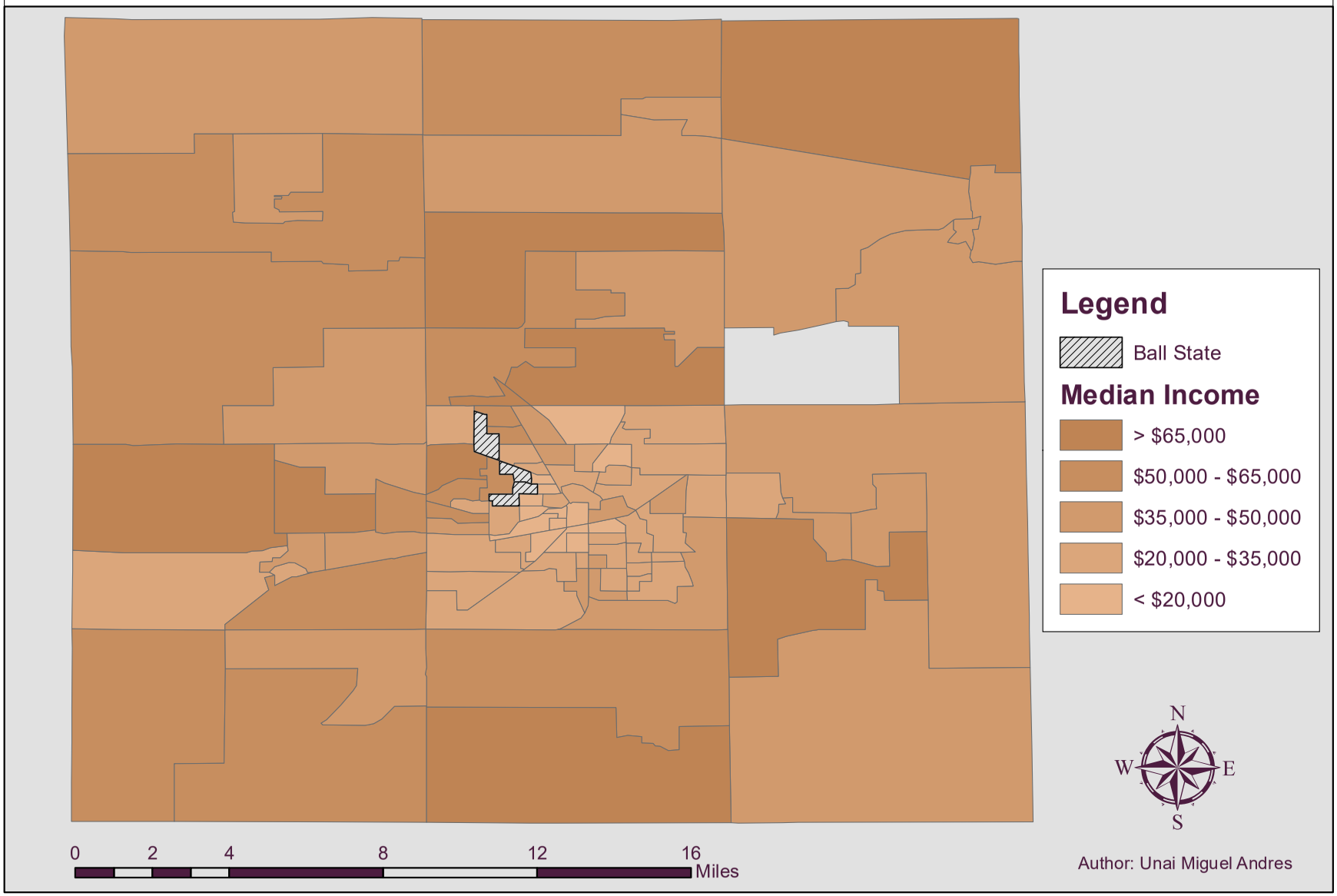
Delaware County Socio-demographics: Household Poverty Rate



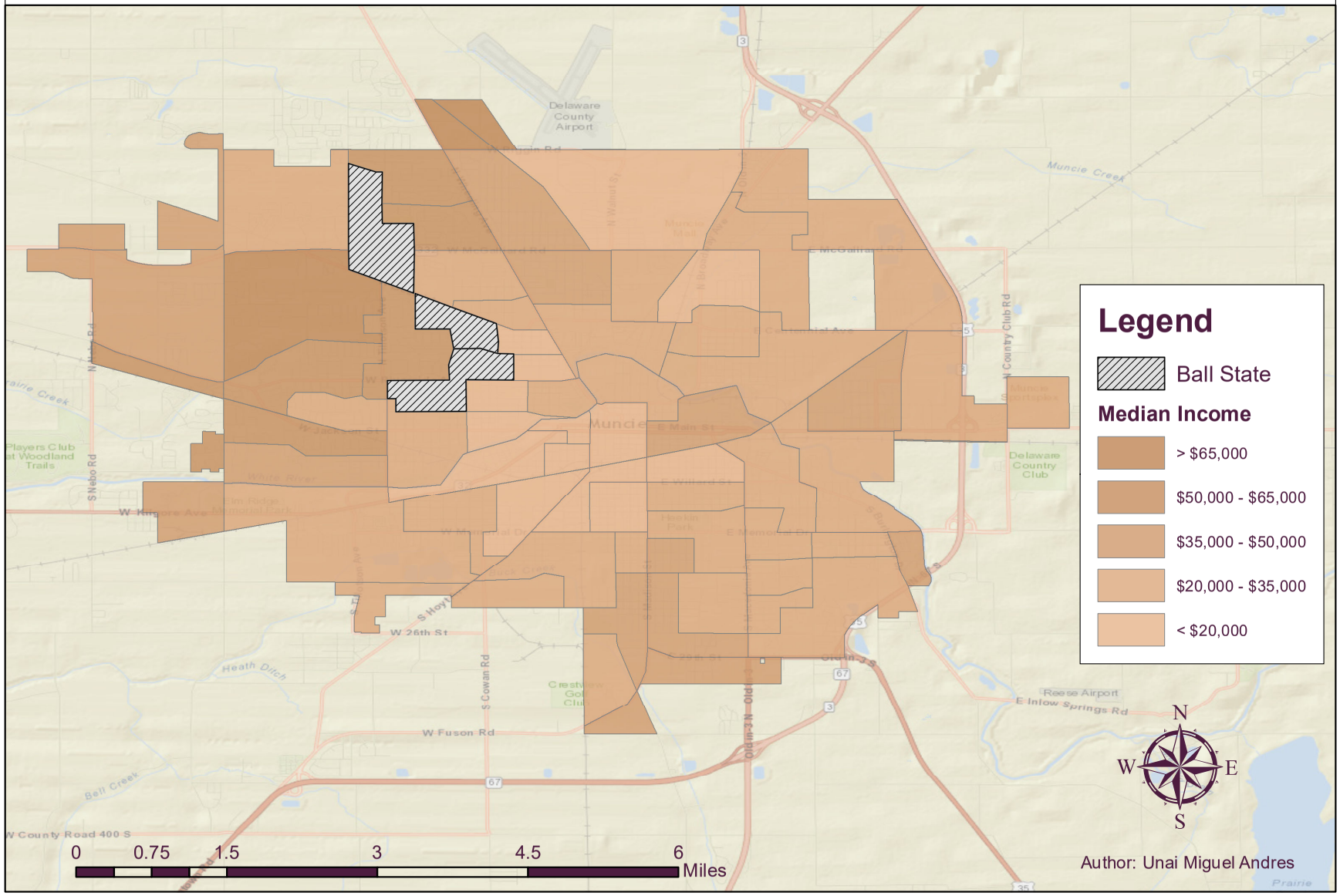
Muncie Socio-demographics: Households Poverty Rate



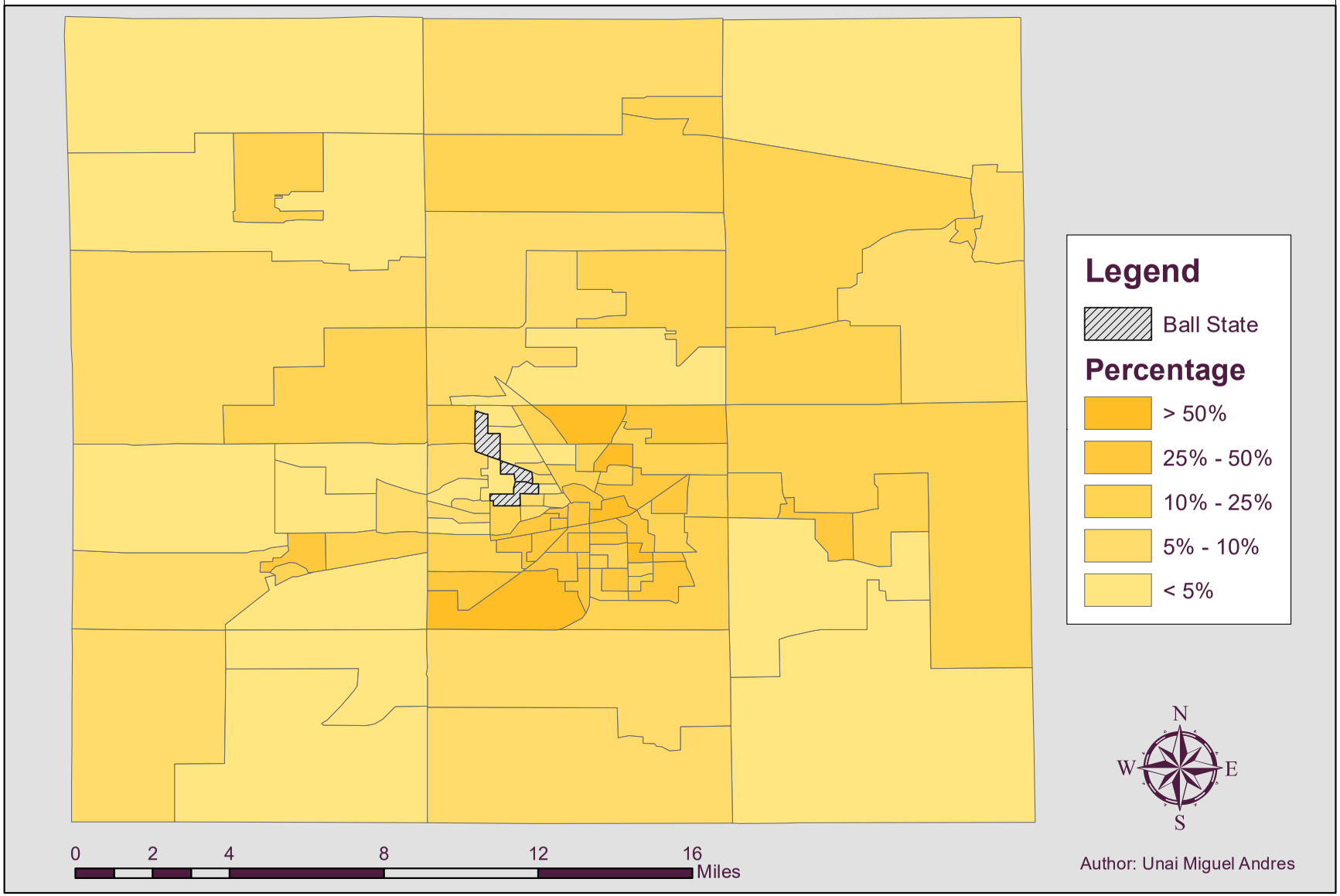
Delaware County Socio-demographics: Median Household Income



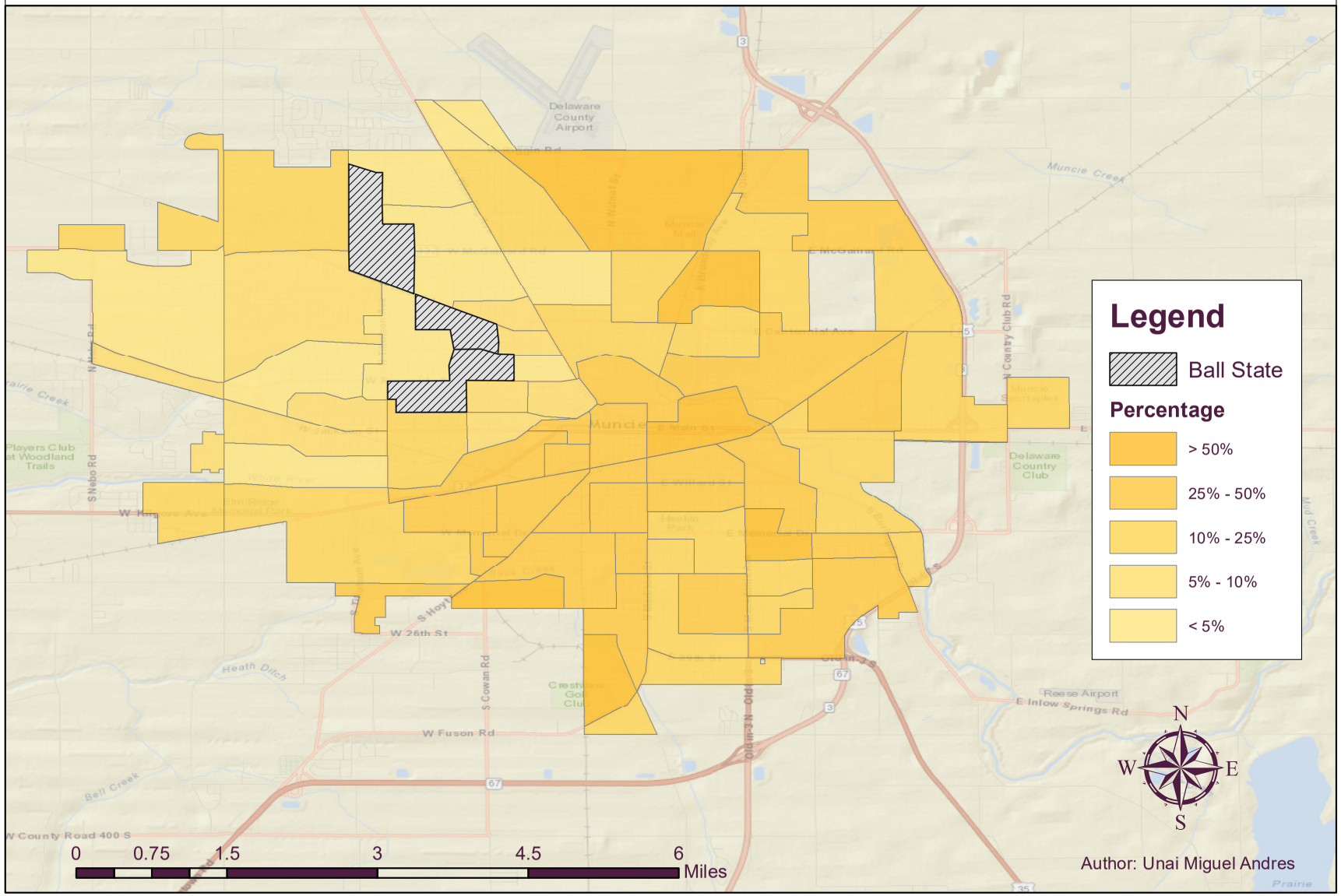
Muncie Socio-demographics: Median Household Income



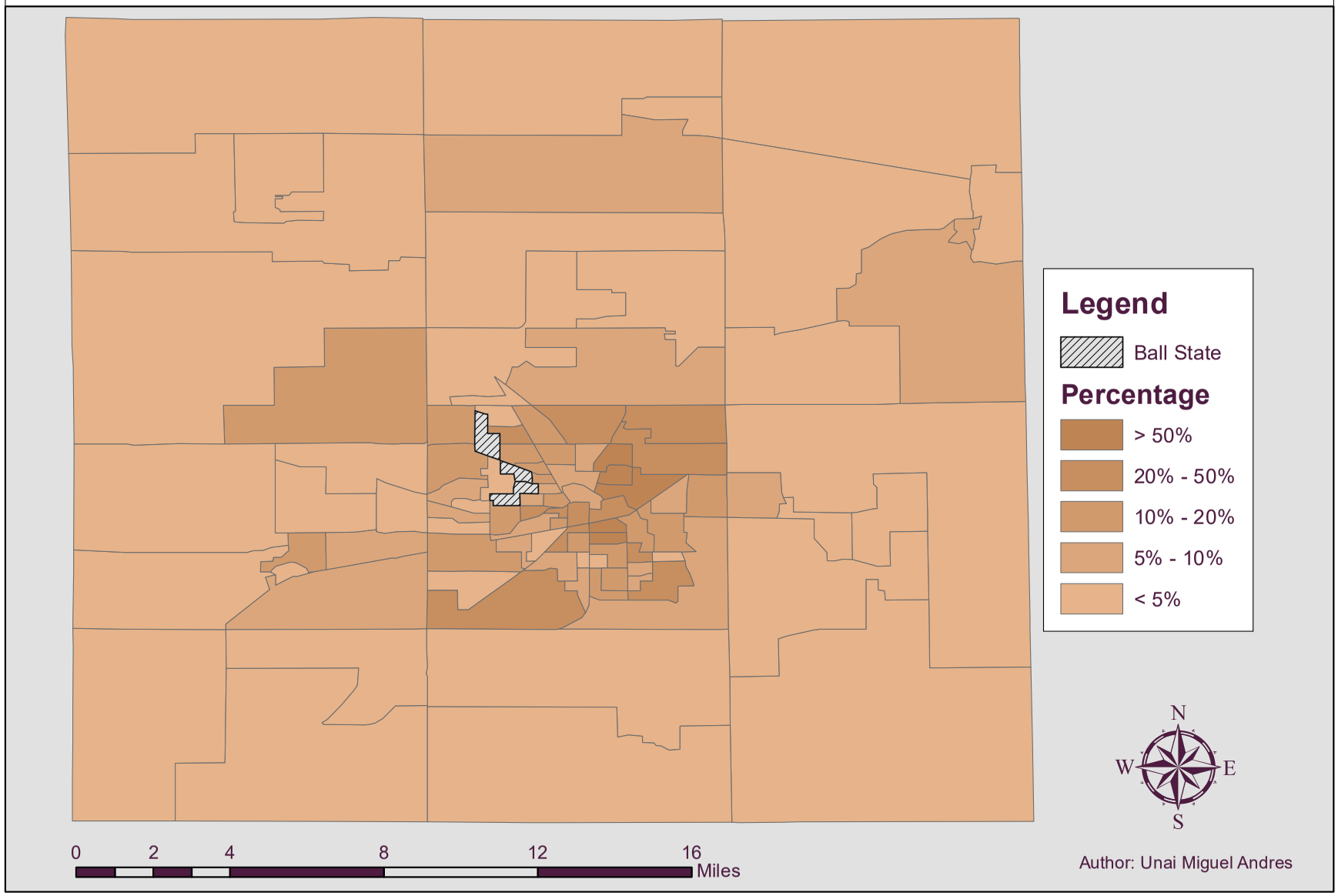
Delaware County Socio-demographics: Households Receiving SNAP Benefits



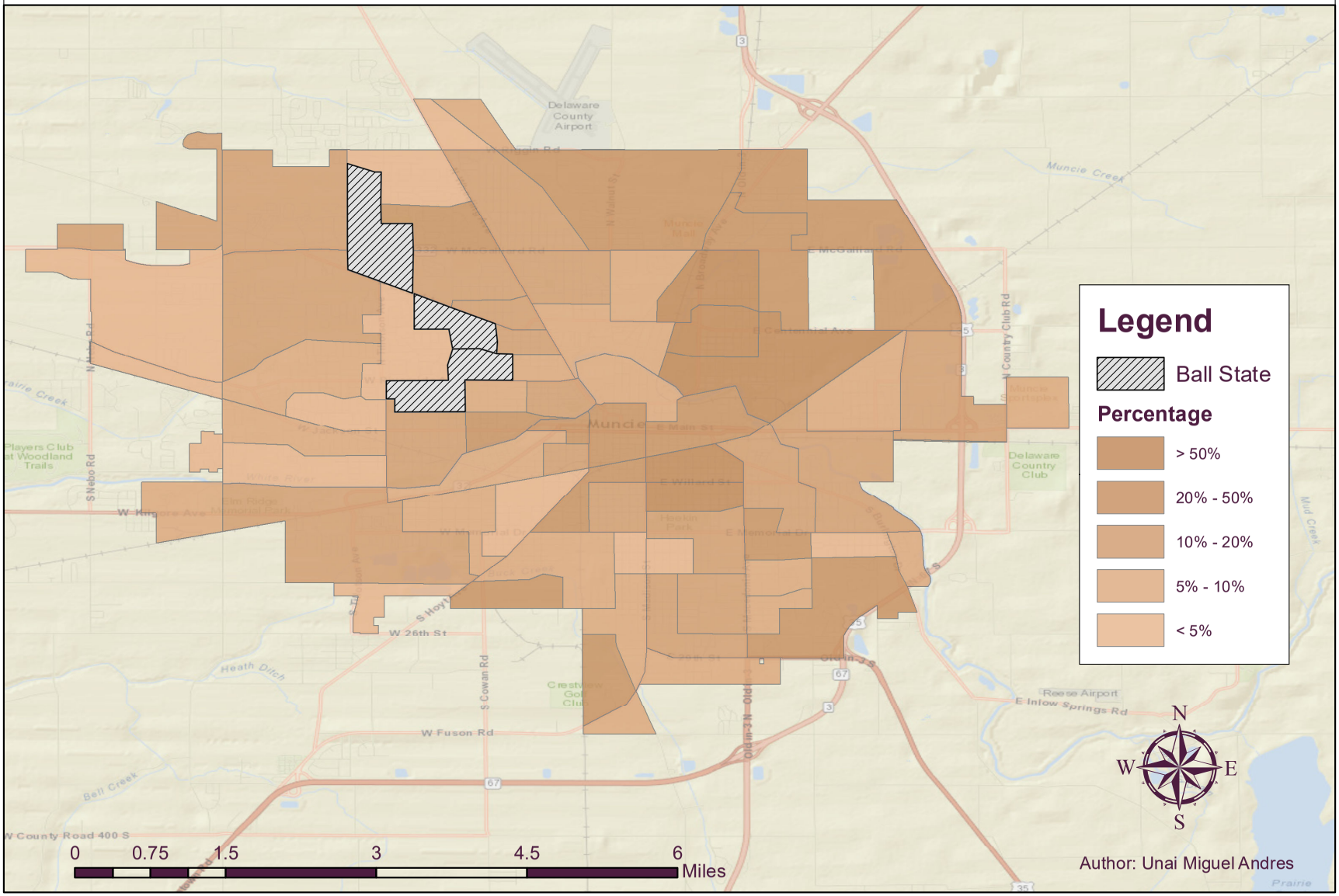
Muncie Socio-demographics: Households Receiving SNAP Benefits



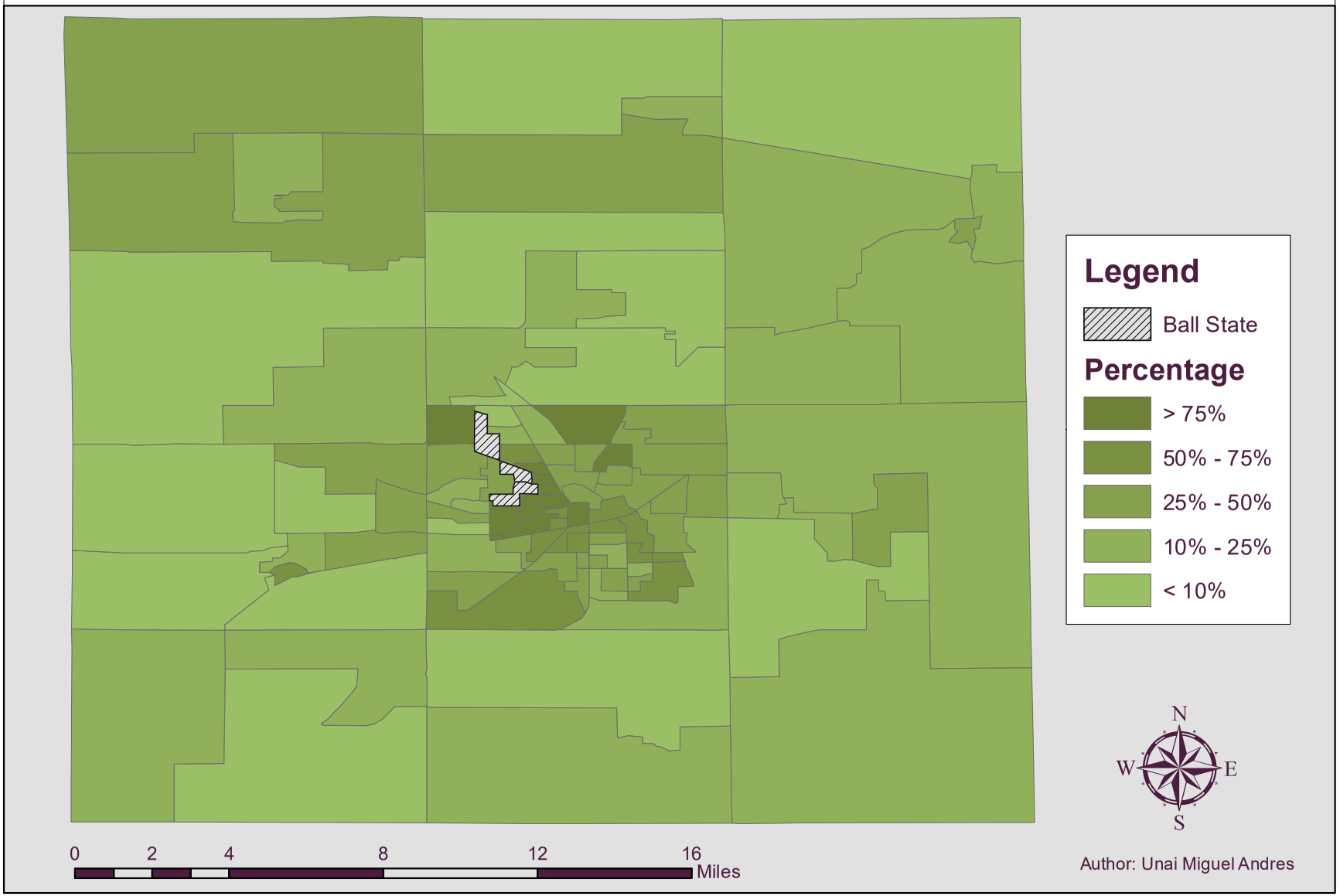
Delaware County Socio-demographics: Percentage of Non-White People



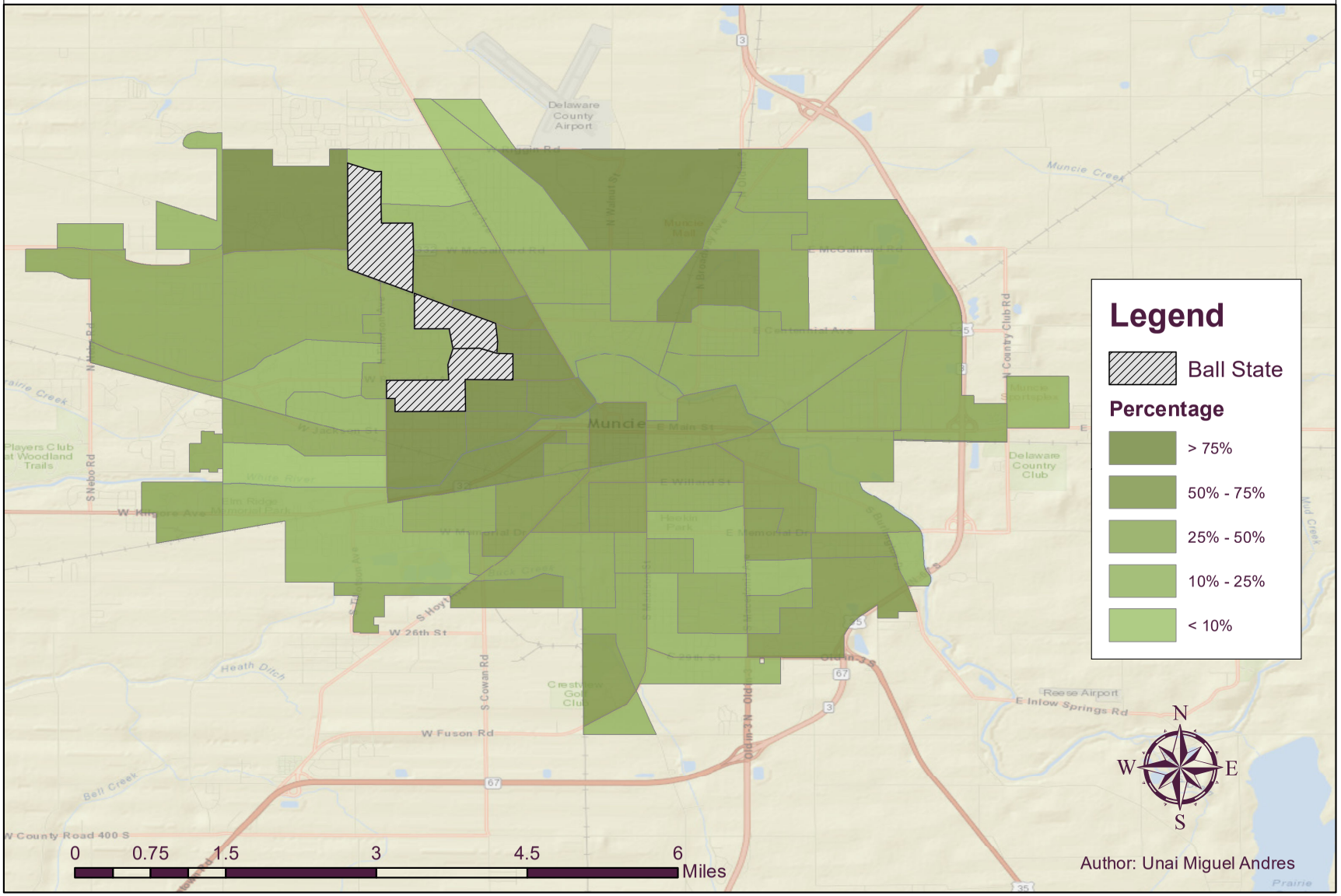
Muncie Socio-demographics: Percentage of Non-White People



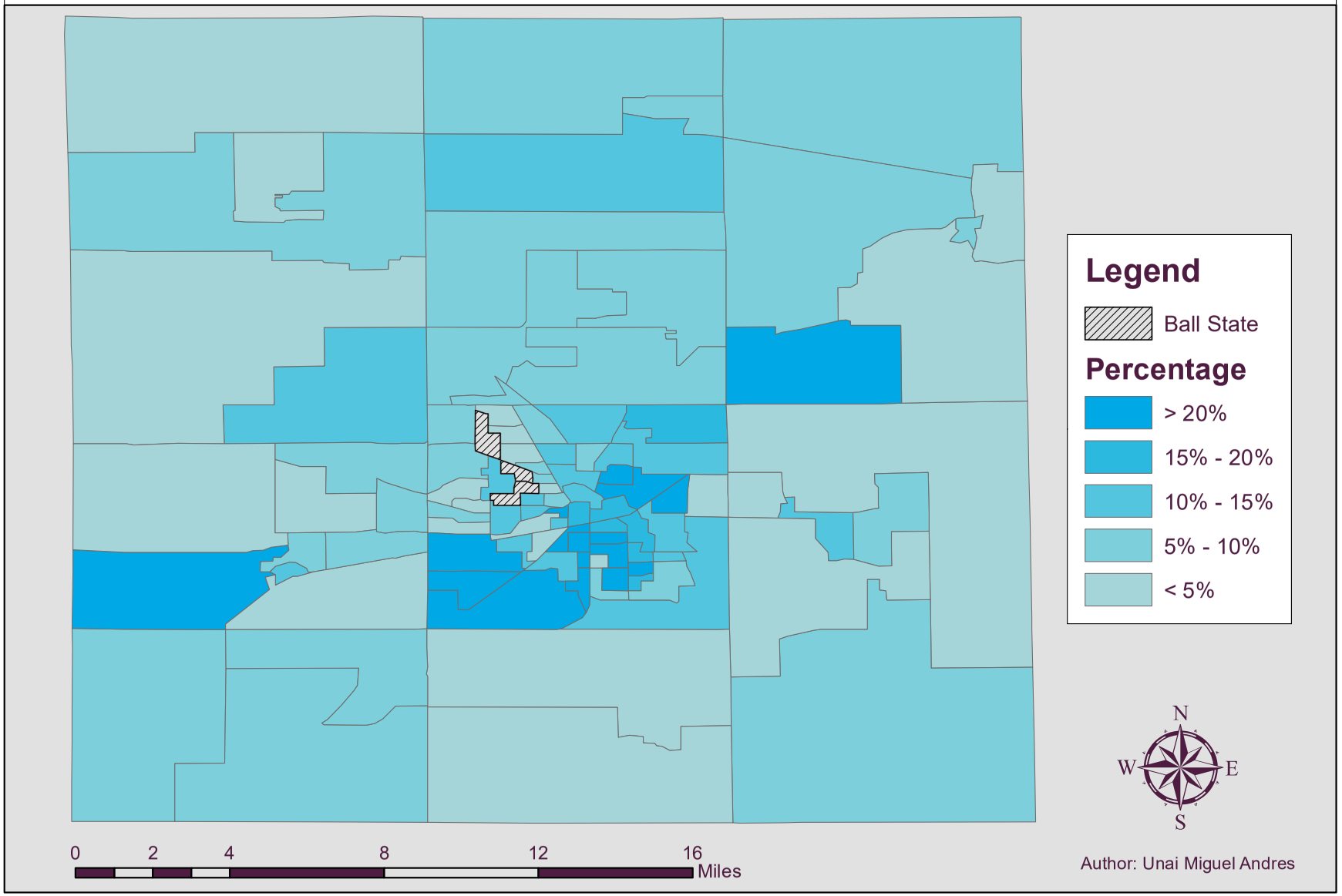
Delaware County Socio-demographics: Renter Occupied Households



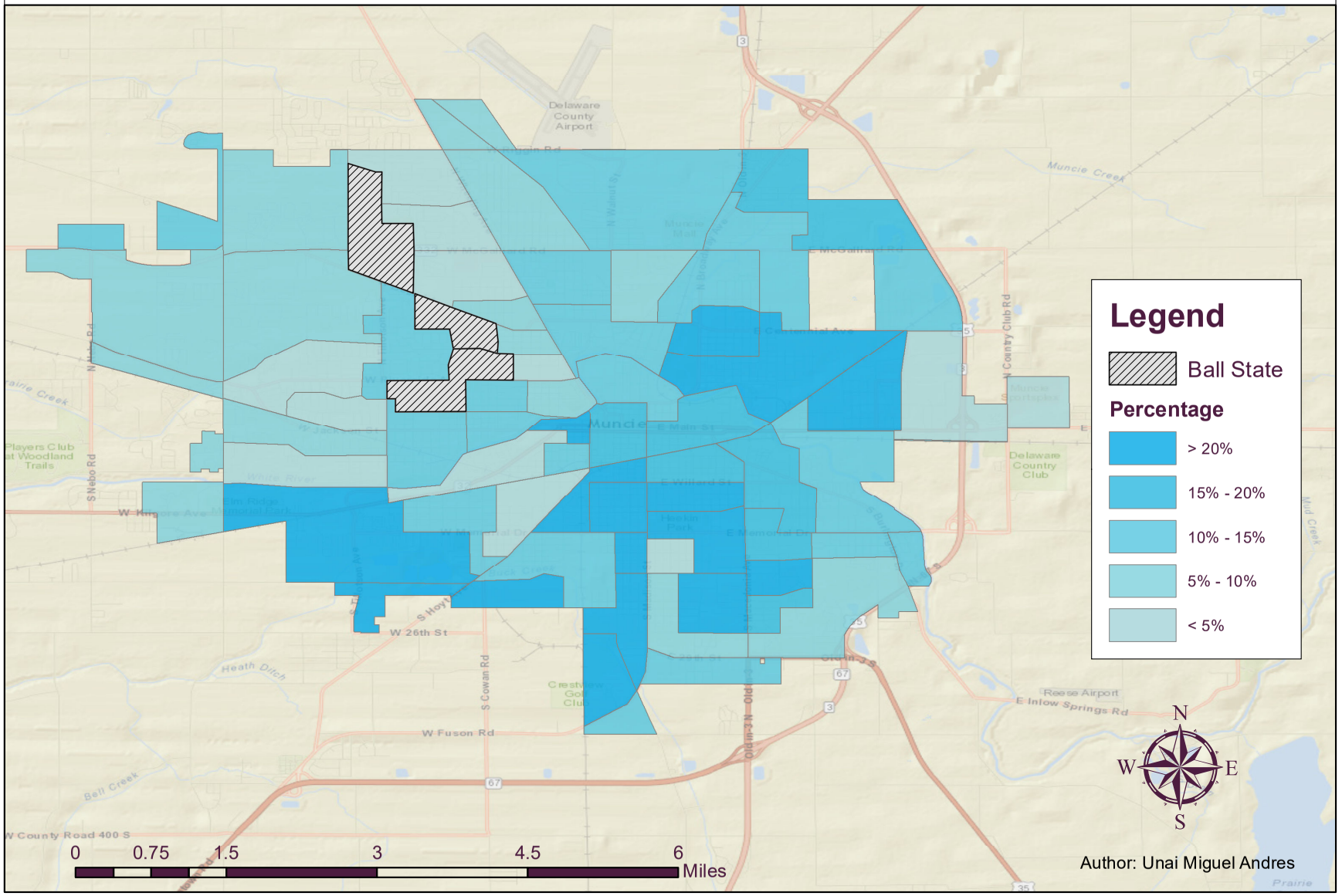
Muncie Socio-demographics: Renter Occupied Households



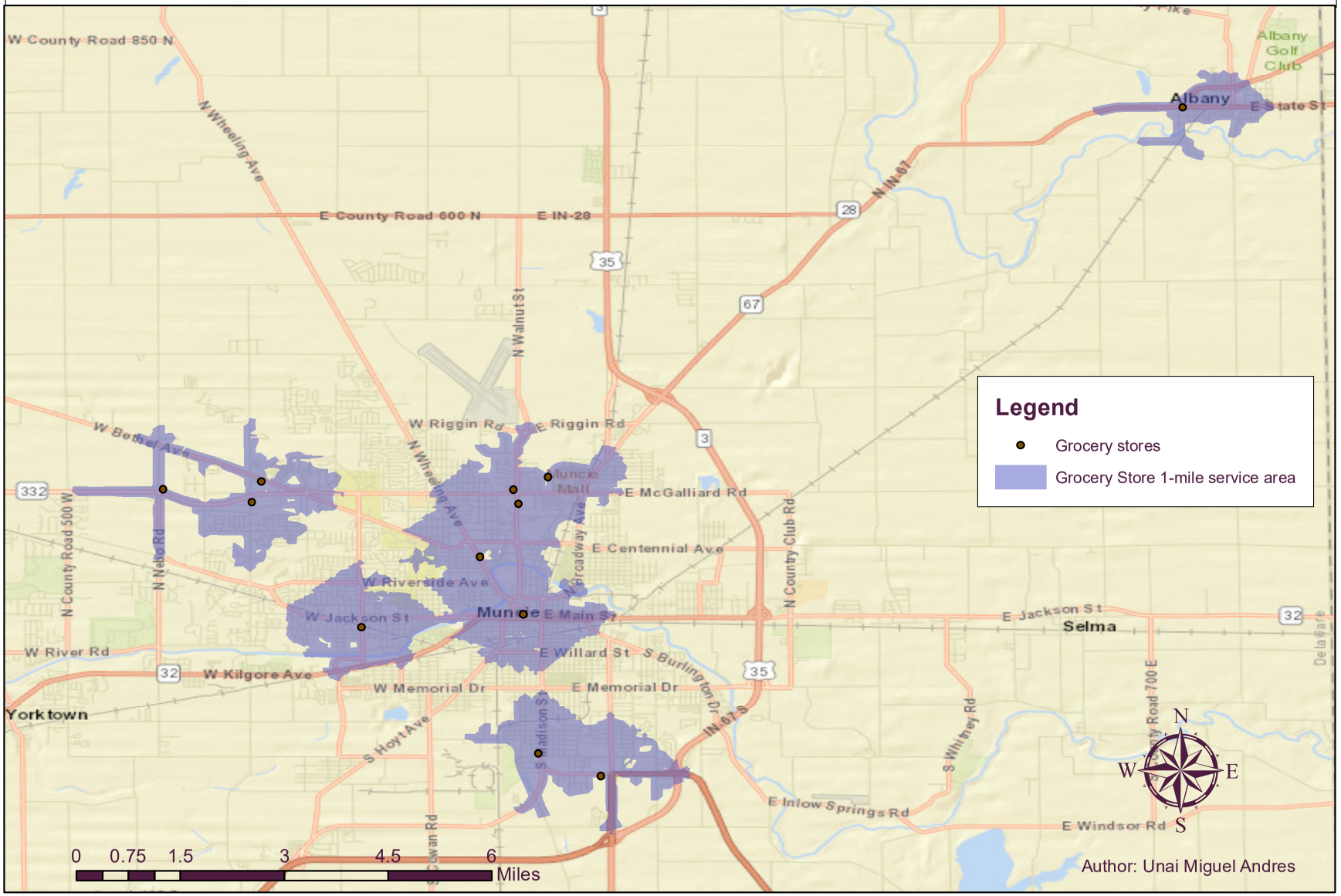
Delaware County Socio-demographics: Unemployment



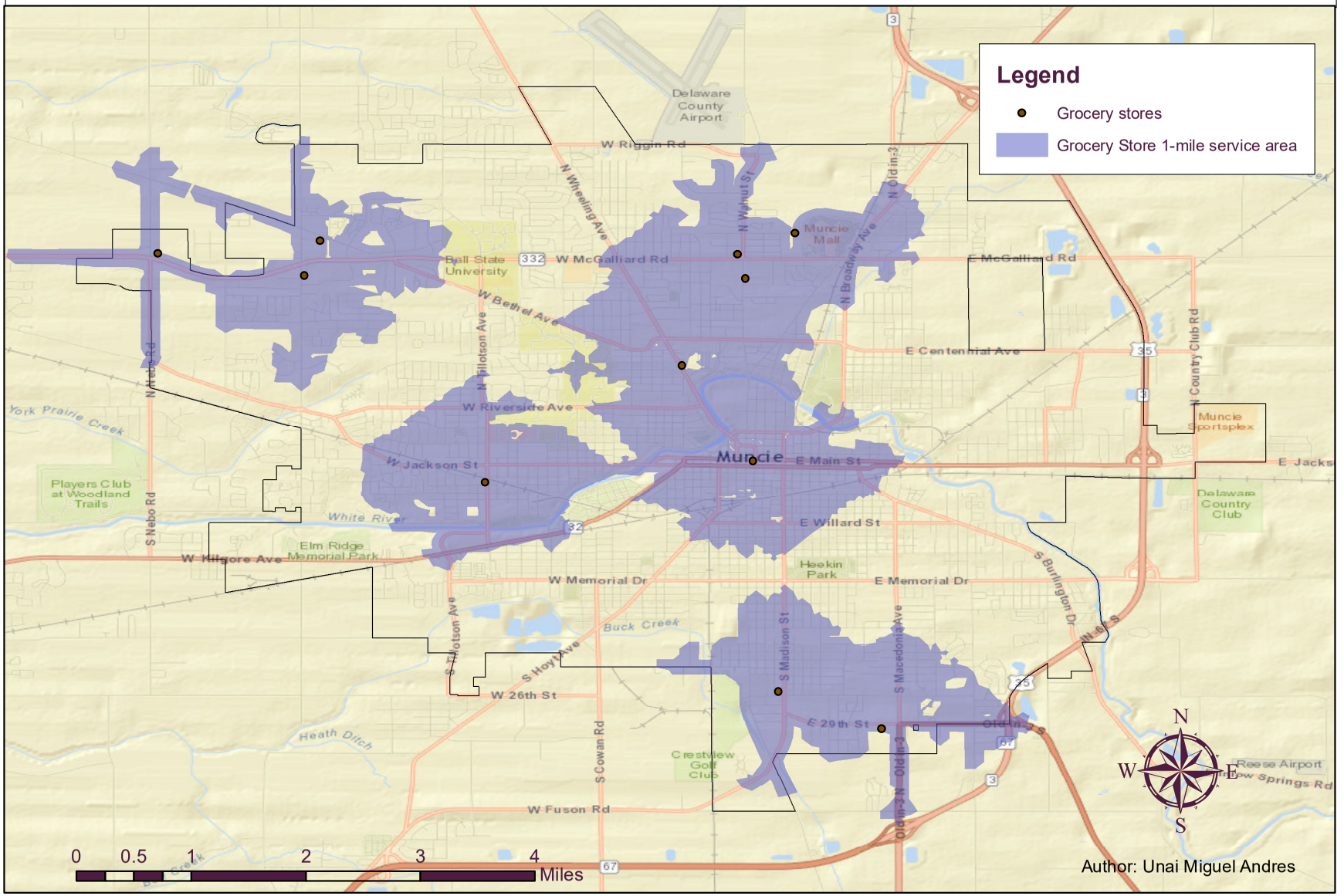
Muncie Socio-demographics: Unemployment



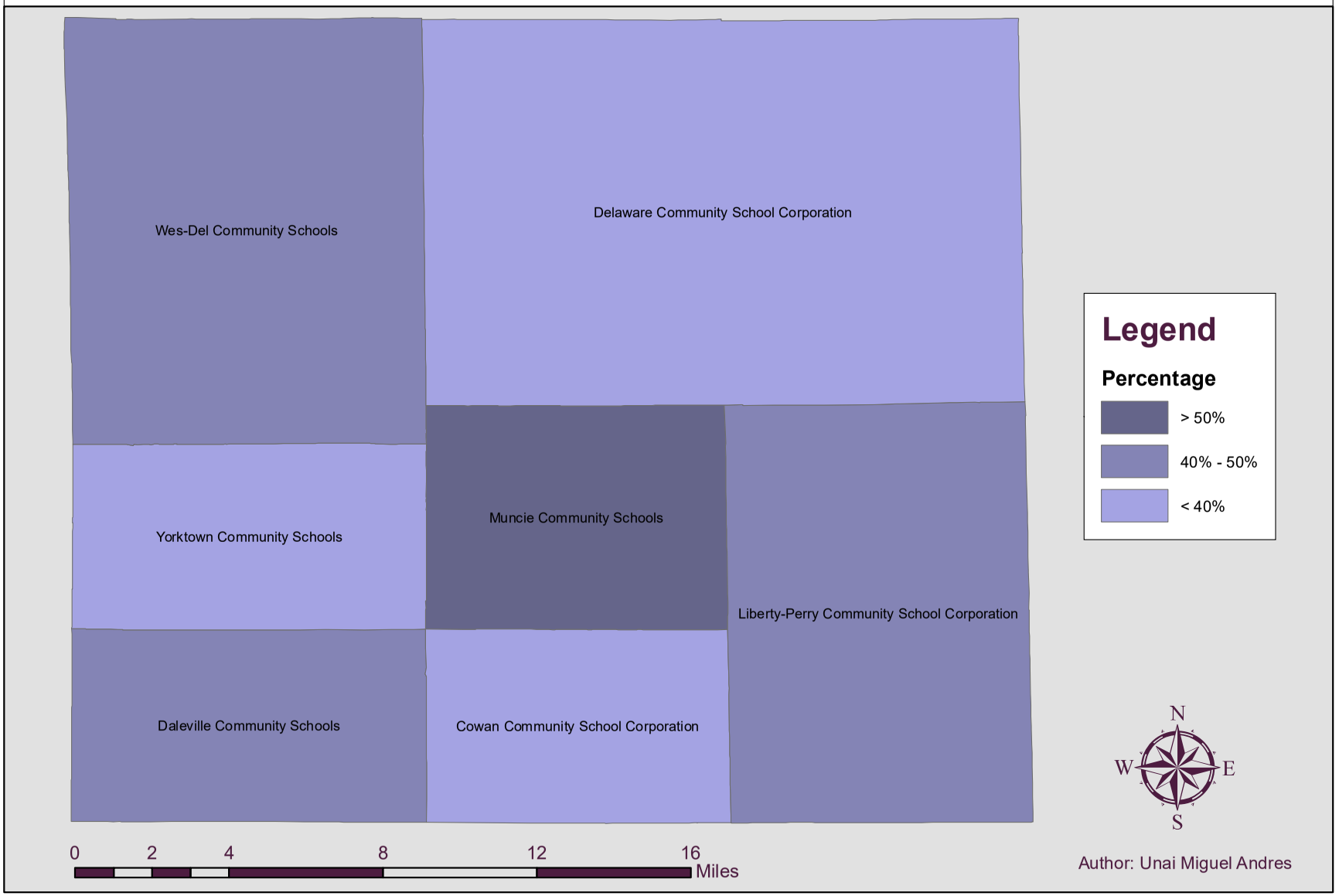
Grocery Store Service Area in Delaware County



Grocery Store Service Area in Muncie



Delaware County Socio-demographics: Kids Receiving Free or Reduced Price Meals



Population living farther than 1 mile from a grocery store