

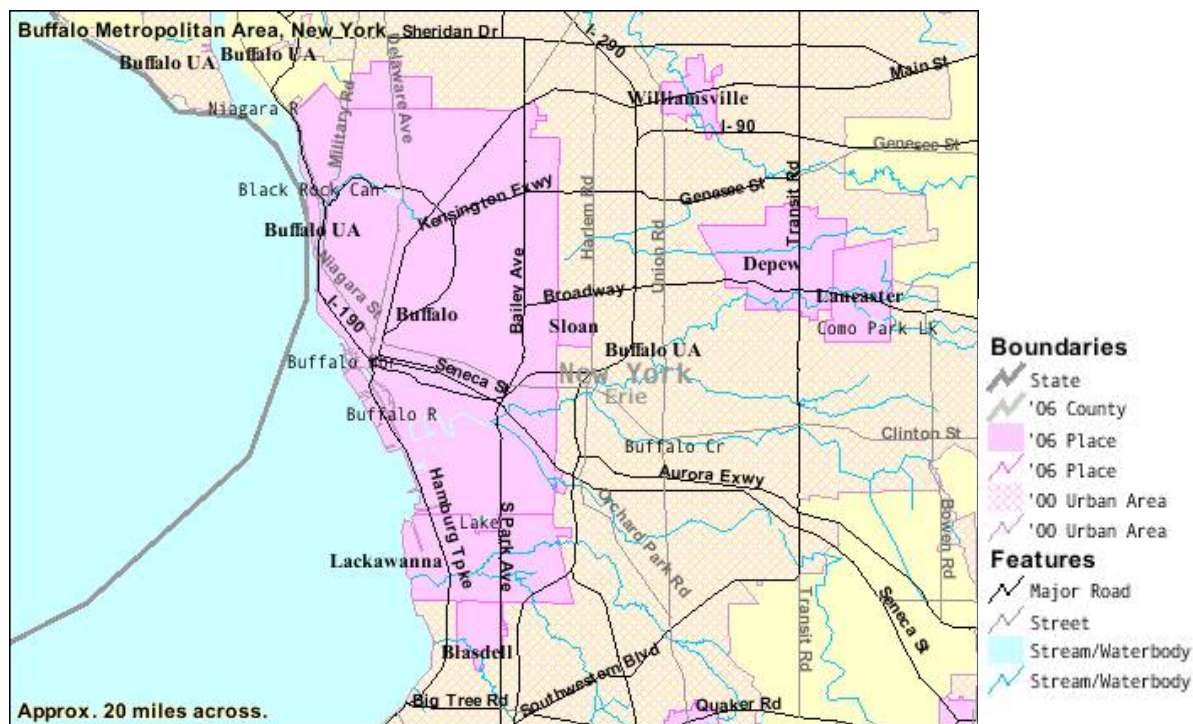
## Project 2: Mapping the Census

### City of Buffalo, Erie County, New York

#### Gretchen Knapp

My home town, the Town of Tonawanda, is north of Buffalo, New York, which is an aging 'Rust Belt' city on Lake Erie (Goldman, 2007). The Buffalo metropolitan area originally was a colonial settlement dating back to the French and Indian Wars of 1754 to 1763 (French and Indian War, 2007).

The British burned the city to the ground in 1813 in retaliation for the destruction by American forces of Niagara-on-the-Lake (then called Newark) in Ontario across the Niagara River (Bowler, 1976). World War II industry dramatically increased the city and county's population (Knapp, 2001). Since the loss of manufacturing starting in the 1970s, the city's population has been steadily dwindling while the suburban areas have grown (Goldman, 2007).



Map scale: 1:4 miles

**Figure 1 – Buffalo Metropolitan Area in Erie County, New York**

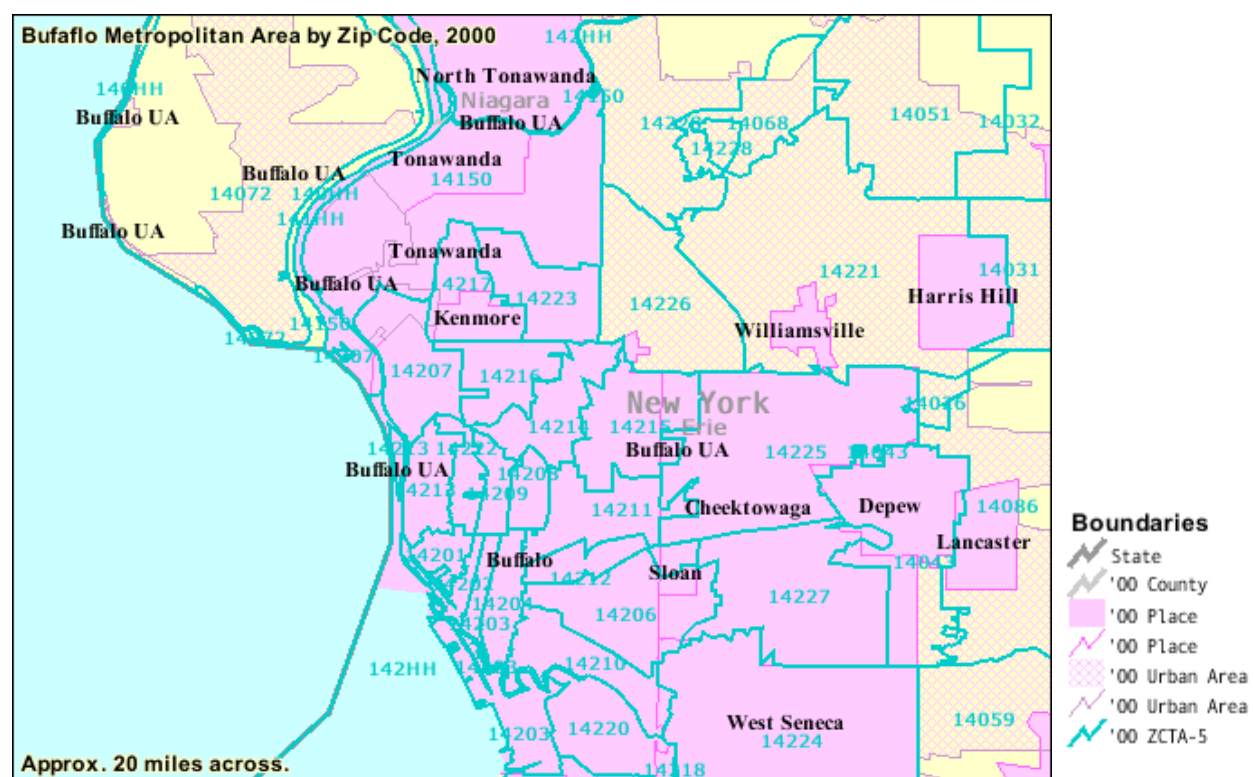
Figure 1 is a reference map of the city of Buffalo along Lake Erie shown with connecting cities (e.g. Sloan, Blasdell, and Lackawanna), outlying suburbs Williamsville, Depew, and Lancaster, and the urban areas that comprise the city's sprawl throughout Erie County, New York. (This area is not to be confused with the city of Erie in Erie County, Pennsylvania, 90 miles southwest on the New York state boundary.) The map scale was calculated on the basis of pixel width of the image. The map will appear smaller or larger if viewed at higher or lower resolution (Sloan, 2007).

The U.S. Census Bureau provides basic boundaries for users to orient themselves in space and to delineate different types of census areas. American FactFinder offers reference map boundaries for 2006 Cities and Towns, 110th Congressional Districts, 2002 Economic Places, 2000 Census Tracts

and Blocks, 2000 Metropolitan Areas, and 2000 American Indian Areas. The purpose of these reference maps are “to display the location and geographic boundaries for Census tabulation areas”, according to the Creating and Using Maps Tutorial (American FactFinder, 2007).

This reference map displays the 2006 Cities and Towns boundaries along with state, county, place, and urban area boundaries, and major road, street, and stream/waterbodies. All of the chosen boundaries are lines, and the place and urban area are also shown as polygons. All of the selected features are lines, and the stream/waterbody is also illustrated as a polygon.

The state boundary which also serves at the international border with Canada cuts through Lake Erie and the Niagara River (home to Niagara Falls). Important features include major roads such as I-90, an interstate highway also known as the New York Thruway; the I-290 or Youngmann Expressway which serves as a beltway; and named streets that provide for north-south and east-west transportation. The Buffalo River, Niagara River, 18-Mile Creek, Cazenovia Creek, and Six-Mile Creek, provide surface water across the county.



Map scale: 1: 4 miles

**Figure 2 – Buffalo Metropolitan Area in Erie County, New York, by Zip Code, 2000**

The map scale was calculated on the basis of pixel width of the image. The map will appear smaller or larger if viewed at higher or lower resolution (Sloan, 2007).

Census divisions such as block groups and census tracts are very useful for locating particular populations geographically and in time. But for epidemiological and marketing studies, reference maps delineated by zip code are often used. For example, public health data such as New York’s Statewide Planning and Research Cooperative System (SPARCS) allows access to its database by zip code of residence while preventing the release of confidential identifying information (New York State Department of Health, 2007).

As shown with Claritas, marketers target potential customers by zip code, hence, the frequency of being asked your zip code when purchasing an item from a retailer (Claritas, 2007). In the reference map above, the state, county, place, urban area, and 5-digit zip codes were chosen as boundaries. All are shown as lines. Places and urban areas are also illustrated as polygons.

The Buffalo Urban Area land mass to the west is Grand Island, which provides access to Niagara Falls via its bridges. In noting the three “Tonawandas” shown above from north to south, the northernmost is the City of North Tonawanda, then the Town of Tonawanda, and finally the City of Tonawanda. For example, the Town of Tonawanda in zip code 14150 has been the subject of several New York State Public Health Department studies for cancer clusters arising from low-level radioactive waste produced by manufacturing plants along the Niagara River (Pignataro, 2002, 2003).

## Using U.S. Census Data to Study Disease Clusters

Epidemiologists also use zip codes to delineate “Areas of Concern” for special medical studies. In 2001 a study of the incidence of endocrine disease (e.g. thyroid, endometriosis) in Western New York involved three areas of concern which were identified by zip code (Carpenter, 2001; EPA, 2005). In 1988 the US Environmental Protection Agency identified 70 sites in Western New York dumping toxic pollutants daily into the Niagara River (EPA, 2004). The endocrine study revealed significant elevations of disorders of the thyroid gland and endometriosis among women who resided in the targeted zip codes, one of which was 14150, my home town. According to the authors, ‘the most striking elevations...was that for thyroid disease in women’ probably due to chronic exposure to pollutions such as PCBs and dioxin via air and water pollution (Carpenter, 2001, p. 845). As a woman with thyroid disease whose high school friends also have high rates of thyroid disease, I find the ability of epidemiologists to study disease clusters using census data by zip codes vital.

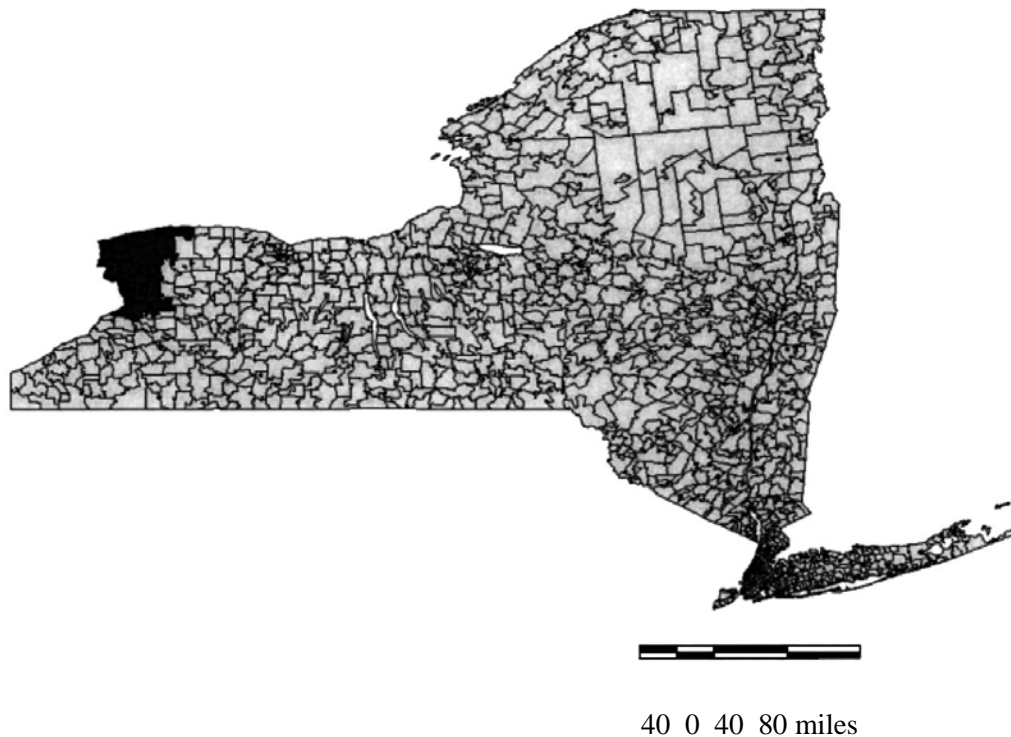
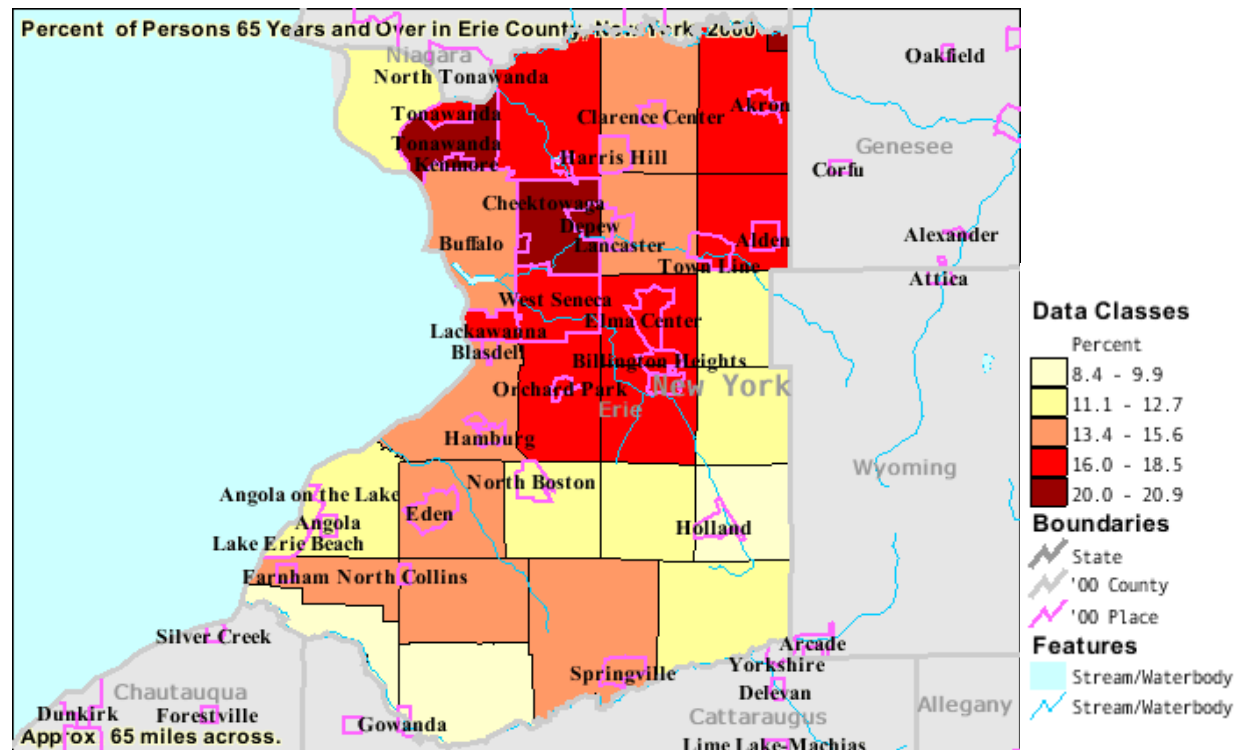


Figure 3. Map of the study area in western New York State, designed to include all ZIP codes within 15 miles of the Buffalo River, Niagara River, and 18 Mile Creek (Carpenter, 2001, p. 846)

Above is the map of the study area from the endocrine disease study divided by zip code. Another use of zip codes for study is to examine the spatial distribution of senior citizens in order to provide adequate community services. Again, census block groups and other measures are useful, but my preference for this type of study is zip codes as community services are linked to administrative units such as local governments rather than block groups or traffic analysis zones. Also, zip codes are areas presented at a spatial resolution large enough to reveal geospatial patterns without being too fine so that the data sets are so small as to be meaningless.

## Using U.S. Census Data to Study Aging in Place



**Figure 4 – Percent of Persons 65 Years and Over in Erie County, New York, 2000**

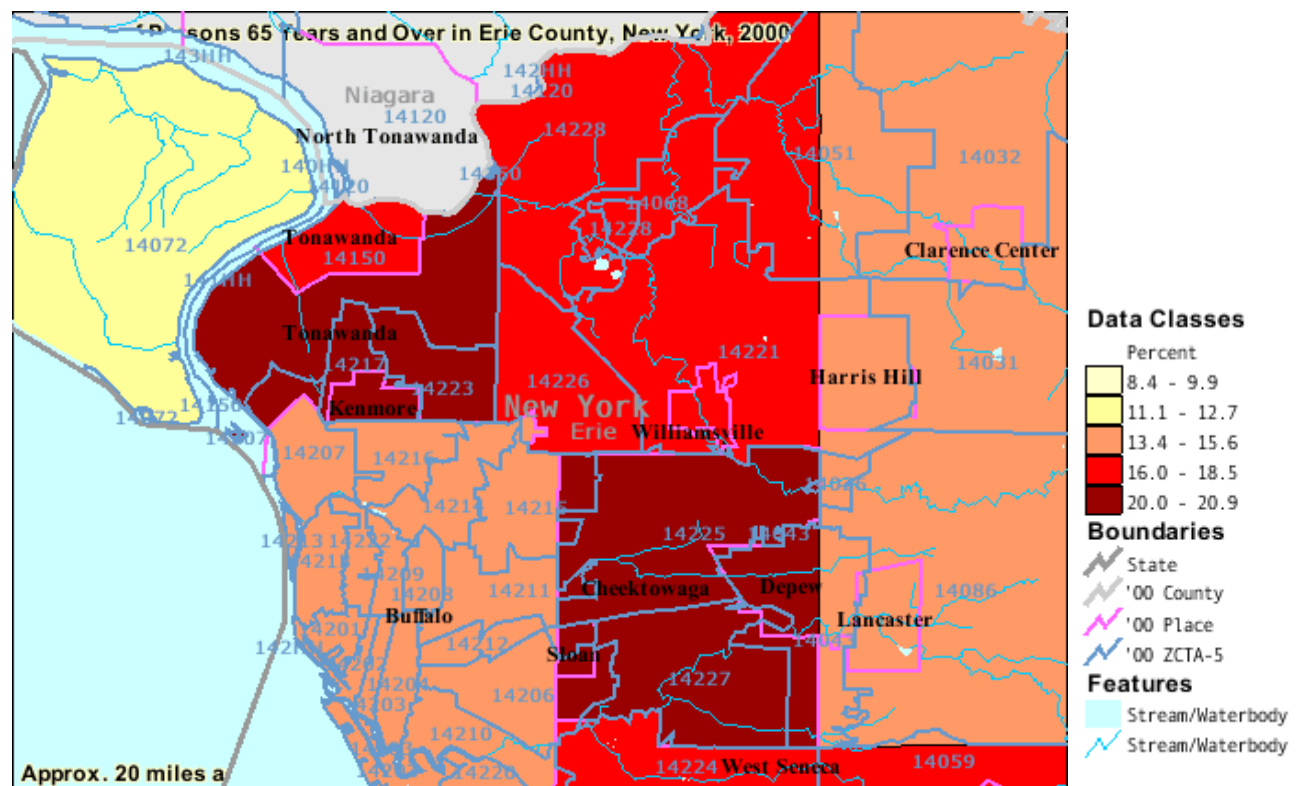
The map scale was calculated on the basis of pixel width of the image. The map will appear smaller or larger if viewed at higher or lower resolution (Sloan, 2007).

Above is a choropleth map of Erie County, New York, utilizing data from American FactFinder's Census 2000 to map the percentage of persons aged 65 years and over aggregated by natural breaks (Jenks) classification. Jenks is the only statistically significant classification offered by American FactFinder; all other methods are subjective. According to American FactFinder, "The Natural Breaks classing method identifies groupings that *naturally* exist in the data." (American FactFinder, 2007). The boundaries are lines showing the state, county, and place perimeters. The features are stream/waterbody, both line and polygon. The source is the U.S. Census Bureau, Census 2000 Summary File 1, Matrices P1, and P30. The attribute data is from Census 2000 Summary File 1 (SF 1) 100-Percent Data for Erie County, New York by County Subdivision, particularly the percent of people aged 65 years and over.



The data classes demonstrate that the minimum percentage of persons 65 and over is 8 percent of the total population and the largest percentage in any given area shown in Figure 3 is almost 21 percent of the total population. These maps only show percentages compared to the total population. In order to make sense of these percentages, we need actual counts. A table created from the 2000 U.S. Census puts the number of persons 65 and over in Erie County at 147,430 (New York State Office for the Aging, 2001) with the total population at 950,255. If this data is broken down by town or city, Buffalo's population aged 60 and over is 49,698 (17 % of total), aged 75 and over (19,524 or 6.7%), and at age 85 and over the population is 5,008 or 1.7% of the total population (Erie County Department of Senior Service, 2007).

But what does the choropleth map reveal about the population density of elderly residents? Is there any way to utilize census data to determine how effectively Erie County's Department of Senior Services is meeting the needs of the older population?



Map Scale 1:4 miles

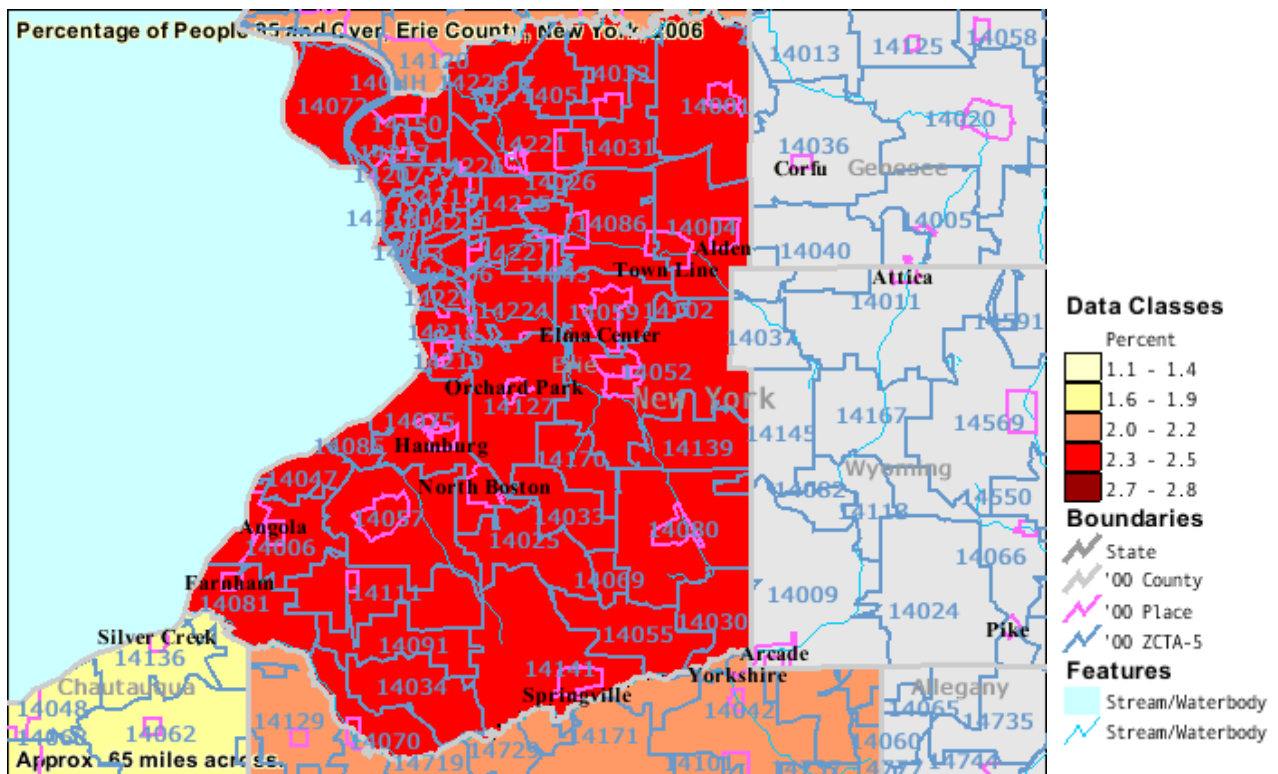
**Figure 5 - Percent of Persons 65 Years and Over by Zip Code in Erie County, New York, 2000**

The map scale was calculated on the basis of pixel width of the image. The map will appear smaller or larger if viewed at higher or lower resolution (Sloan, 2007).

In the close-up above of the most densely populated areas in Erie County separated by zip code, two areas stand out. The first area, which is closest to manufacturing plants along the Niagara River and Lake Erie, contains the city of Tonawanda and the village of Kenmore, which are administered together. These areas are north of Buffalo proper and the first suburbs of the city of Buffalo, dating back to the 19th century. The second area, which is east of Buffalo proper, includes suburbs created by the location of defense plants outside the city during World War II (Knapp, 2000).

The next data class grouping of 16 to 18.5 percent of the total population 65 years and over includes urban areas north and east of the city of Buffalo (known as the “North Towns”) and south and east of the city of Buffalo (known as the “South Towns” or snow belt). Grand Island has the smallest percentage of elderly residents while Buffalo and the rural areas containing Clarence Center and Lancaster contain 13.4 to 15.6 percentage of older residents as a percentage of total population.

Unfortunately, the 2000 Census does not allow the mapping of this population to the more specific demographic characteristics found in its tables, such as persons 75 years and over as well as persons 85 years and older, which are known as the “oldest old”. The latter category would include my parents, who live in the 14150 zip code area of Tonawanda, which is in the 16 to 18.5% density range. For more detailed information, we must consult the American Community Survey.



Map scale 1:13 miles

**Figure 6 - Percent of Persons 85 Years and Over by County in Erie County, New York, 2007**

The map scale was calculated on the basis of pixel width of the image. The map will appear smaller or larger if viewed at higher or lower resolution (Sloan, 2007).

The 2006 American Community Survey provided the population density of persons 85 years and older aggregated by county by the natural breaks (Jenks) classification method for figure 6. In comparison with its neighbors, Erie County’s “oldest old” population is 2.3 to 2.5 percent of the total population. American Community Survey can provide additional information although at a larger aggregation area about specific populations for years in which the decennial census is not scheduled. This map illustrates that Erie County in New York State has the highest density of people 85 and over in Western New York. If it were possible to overlay Figure 5 and Figure 4, we might conclude that the areas such as the Tonawandas and Cheektowaga-Depew, which clearly contain high densities of people 65 and

over also contain high densities of people 85 and over. Without zip-code level data, however, that possible conclusion remains a hypothesis because we are comparing county-level data with zip-code level data, rather like apples and oranges.

Because of the discrepancy, the American Community Survey website provides recommendations about comparing ACS data with 2000 census data (ACS, 2007). For age, ACS warns the researcher to “compare with caution” because, obviously, people counted as age 65 and older in 2000 will be six years older in 2006 (ACS, 2007). Thus, if a person was aged 79 at the census in 2000, that individual would have been counted as aged 75 and over by ACS in 2000 to 2005, and then as aged 85 and over in 2006. Whenever data count categories are created, it is important to take into account what might not be captured in the data. Any census or survey is a snapshot in time and space. An individual aged 85 and older today residing in Orchard Park in Erie County could be living in another county or state in 2010. In any case, the decennial census dataset is far larger and more representative of the population than the American Community Surveys which survey three million Americans but provide limited datasets beginning at populations of 65,000 or more. This can make using block groups and other small census units more challenging.

Nevertheless, we can put forth several hypotheses as to what the choropleth map reveals about the population density of elderly residents in Erie County. These neighborhoods may have a high number of elderly residents because they never moved, demonstrating a stable residential pattern. The areas in question may be particularly beneficial to elderly residents due to the range and availability of community services. Perhaps the pattern we see is an artifact of the number of assisted living and nursing homes in a particular area where large numbers of senior citizens reside. Maybe elderly parents or grandparents return to Western New York to live with children or relatives. Without more information all we have are several hypotheses ready for testing.

## **Using U.S. Census Data to Meet Community Needs**

As to the second question, is there any way to utilize census data to determine how effectively Erie County’s Department of Senior Services is meeting the needs of the older population? Certainly. The demographic characteristics of elderly citizens allows researchers to look at poverty status, income levels, sources of income, percentage of total income from sources such as Social Security, race and gender, ethnicity, marital status, education, disability, and living arrangements. Researchers can use these datasets in combination with GIS maps to examine the proximity of elderly residents to services such as health care, affordable housing, senior centers, and public transportation routes and plan accordingly.

Movements such as “Aging in Place” encourages communities to promote planning to become more senior-friendly so that residents can “age in place” rather than have to relocate for needed services (Erie County Department of Senior Services, 2007). Reauthorization in 2005 by the U.S. Congress of the Older Americans Act, first passed in 1964, is providing more resources for state, counties, and cities to help residents safely “age in place” (U.S. Administration on Aging, 2007).

The U.S. Census Bureau is an excellent resource for persons interested in demographic data about American populations. In this paper we have focused only on census data from the decennial census and the American Community Survey pertaining to older adult populations in Erie County, New York. The American FactFinder website provides a wide variety of specialized datasets with regard to economic status, household composition, migration patterns, ethnicity, and age-related employment and education. Like many tools, we must respect its limits. These include fixed zoom in and zoom out levels, the inability to compare all collected datasets from the decennial census and American Community Survey against each other, and, most of all, simple mapping properties that do not allow

overlay or intersect geoprocessing operations. Nonetheless, the U.S. Census Bureau and its predecessor, the Statistical Abstract, are widely useful sources of social and economic data about American populations and their lives. Being able to download this information as tables or maps is a major improvement over using them in hard copy. The Census is a powerful information source for vital functions such as community development, epidemiology, marketing, urban planning, and economic sustainability.

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