American Community Survey and Census Comparison
Final Analytical Report

Vilas and Oneida Counties, Wisconsin
Flathead and Lake Counties, Montana

Submitted by:

Paul M. Van Auken
Roger B. Hammer
Paul R. Voss
Daniel L. Veroff

Applied Population Laboratory
University of Wisconsin-Madison
March 5, 2004

Prepared for the Bureau of the Census
under Order No. YA1323-03-SE-0316
May 1, 2003
Requisition/Reference No. 03-32136-0-0
This paper expresses the views of the authors

Table of Contents

I. Introduction

In May 2003 the University of Wisconsin Applied Population Laboratory initiated a comparison of the pooled 1999 – 2001 American Community Survey (ACS) data with the corresponding Census 2000 long form population and housing characteristics for the county and census tract levels in Oneida and Vilas Counties (Wisconsin) and Lake and Flathead Counties (Montana) on behalf of the U.S. Census Bureau. This document presents the key findings of this analysis.

A. Background

Since 1790, the federal government has conducted a census every ten years to collect demographic, social, economic, and housing information about residents of the U.S. (U.S. Congress 2000). The current decennial census accomplishes two primary objectives: 1) it enumerates the population of the U.S. through the "short form," and 2) it obtains demographic, housing, social, and economic information by asking a 1-in-6 sample of households to fill out a "long form" questionnaire, data that is used for the administration of public programs and the distribution of nearly $200 billion of federal money (U.S. Congress 2000). The Census Bureau has used this two-pronged approach to count and characterize the population of the U.S. since 1940 (HUD 2002).

The information provided by the long form is used by government units at all levels to make public funding decisions based on population density and growth, ethnic makeup, and apparent need in communities, by demographers and other researchers interested in studying population and health trends, and by the private sector to inform business decisions. Simply put, innumerable decisions – by public and private organizations and individuals, from the level of the rural village to the metropolitan city – hinge on the information provided by the long form.

Because the census is taken only once every ten years, the information rapidly becomes obsolete. According to U.S. Representative Sue Maloney, "the information collected by the long form goes out of date after 2 to 3 years" (U.S. Congress 2000, 5). Data end users, therefore, become reluctant to rely on it to make decisions that affect the lives of millions throughout the country (U.S. Census Bureau 2003, 2), but even as the decade following the decennial census progresses the census remains, by necessity, an important tool in informing research and public policy. Rural decision makers in small municipal governments are at an even greater disadvantage. Due to their small staffs and lack of resources for research, they are often forced to rely on the census throughout the decade. Leaders of rural communities with significant seasonal residents have long complained that long form data does not accurately portray their populations – because a substantial portion is not counted – which has important ramifications for planning and public funding. U.S. Representative Jo Ann Emerson indicates that "in this era of decentralized, community-based decision-making, these communities are in dire need of more accurate and timely information upon which to base future decision-making" (U.S. Congress 2000, 12).

Regarding the plans for the 2000 Census, in 1995 the U.S. General Accounting Office indicated that,

> …the established approach used to conduct the 1990 Census had exhausted its potential for counting the population cost-effectively and that the

> fundamental design changes were needed to reduce costs and improve the quality of the data collected (GAO 2002).

There has also been a growing concern that the public's desire for privacy is causing resistance to surveys like the census long form.

If the plans of the Census Bureau are realized as expected, the current decennial long form sample – the basic source of detailed information about Americans – will soon be replaced by a new survey methodology. The American Community Survey (ACS) has been designed by the Census Bureau as an ongoing monthly mail survey to spread the cost and effort of gathering long form-type data over the course of a decade. The Census Bureau believes that over the course of a year, the ACS will collect data through monthly samples sufficient to provide large communities with demographic information of similar, but slightly less statistical precision, than that of the census long form.[1] The ability to update this demographic portrait annually renders the ACS data more useful than the "snapshot" taken on April 1 every ten years.

B. Literature Review

Although demographers and statisticians in the U.S. had discussed a large-scale monthly survey for several decades, following the 1990 census Congressional interest in producing more accurate and timely social and economic information for America's states, counties, municipalities, and neighborhoods prompted the Census Bureau to develop the ACS (U.S. Congress 2000). The ACS began as a series of general discussions of "continuous measurement (CM)" in Census Bureau and Commerce Department advisory committees and matured during the decade into a formal initiative (U.S. Census Bureau 2003, 2).

These efforts resulted in a survey design that includes a monthly sample of addresses and a survey instrument much like the traditional census long form. These monthly samples, when pooled across time, are designed to provide annual intercensal estimates of social and economic characteristics for all areas of the nation, including small geographic areas, such as rural townships and census tracts and block groups, and small subpopulations, such as race and ancestry groups. According to the Census Bureau, the ACS will give communities a "fresh look at how they are changing" (U.S. Census Bureau 2003, 2).

The ACS will provide estimates of demographic, housing, social, and economic characteristics every year for every state, along with such information for all cities, counties, and metropolitan areas of 65,000 people or more (U.S. Census Bureau 2003, 2). For smaller areas like census tracts, the Census Bureau believes it will take three to five years to build sufficient sample to produce reliable data. For example, communities with populations of 20,000 to 65,000 can use data aggregated over three years, but for rural areas and city neighborhoods of less than 20,000 people, the Census Bureau predicts that it will take five years to create a sample that is similar in

[1] According to Gregg Diffendal of the U.S. Census Bureau, "By design, the ACS will always require 5 years of data to be aggregated to produce estimates whose reliability is comparable to the census long form sample. This is true regardless of the size of the geographic area being considered. While the ACS will have a sufficiently large sample size to produce annual estimates for areas with 65,000+ population, it does not mean that the associated reliability from these annual estimates will be comparable to that from the long form sample. The ACS has never contended that its annual estimates would be as reliable as the long form sample" (2004).

statistical reliability to that of the decennial census (U.S. Census Bureau 2003, 2). The ACS will become a "rolling survey" as these averages are updated each year after the reliable sample size is reached. The rolling survey is an outgrowth of a concept attributed variously to statistician Leslie Kish (Spar 2003) and to former Census Bureau employee Phillip Hauser, who conceived of an "annual sample survey" in 1941 (Symens Smith 1998).

There are other important differences between the long form and ACS. Whereas as the long form utilizes the decennial census "usual residence" concept in determining residency status and eligibility for enumeration, the ACS uses a concept more akin to a "de facto residence concept." Members of the household are eligible for the ACS if they reside in the household at the time of interview for at least two months around the point of contact (U.S. Census Bureau 2003, 2). This will lead to absolute and conceptual differences in the characteristics tabulated, a critical piece of the context of our analysis. Socioeconomic items like income represent an average number derived from successive monthly samples in the ACS as opposed to the point-in-time reference of the long form, which changes the conceptual basis of the measure (Salvo and Lobo 2002).

Rather than relying upon temporary workers to collect census data – making it the nation's largest employer during the decennial collection period (Mattmiller 1999) – the ACS will utilize full-time staff working on the program year-round. The long form has been implemented in the past using various combinations of mail surveys and face-to-face enumeration, from "mailout/mailback," to "update/leave," to "list or update/enumerate." The ACS is designed to primarily be a mailout/mailback survey; telephone follow-up and then finally personal visits will only be utilized if there is no self-response from the household (Bench 2003). Each of the twelve monthly samples conducted every year has a three month data collection period, with the first month being by mail and the second month by telephone follow-up. The households that have not responded by mail or telephone after two months are then sampled at a rate of 1-in-3. Those selected in the 1-in-3 sample are then contacted via a personal visit from ACS field staff during the third month of the data collection period (U.S. Census Bureau 2003, 2).

The ACS is a key element of the Census Bureau's plans to reengineer the census for 2010. The actual decennial count of the population will be carried out using a brief census questionnaire much like the present short form. The ACS will replace the long form in gathering detailed information about the population's characteristics. The ACS is being implemented in three stages:

1. Demonstration period 1996-1998: It began with implementation in four sites in 1996 and was expanded to eight sites in 1997.
2. Comparison sites 1999-ongoing until full implementation: The number of sites in the sample increased to 31 comparison sites involving 36 U.S. counties.
3. Full implementation nationwide, pending Congressional funding: The Census Bureau planned to implement the ACS in every county of the United States with an annual sample of three million housing units starting in 2003. The ACS would obviate the need for the use of the long form in 2010. Due to a delay in full funding, this implementation has not yet begun, but given the provision of funding by Congress for fiscal year 2004, the plan is to start full implementation in July 2004 (U.S. Census Bureau 2003, 2, Diffendal 2004).

The Census Bureau clearly believes that the ACS will greatly improve its data collection system, as indicated from the following:

> The American Community Survey can identify changes in an area's population and give an up-to-date statistical picture when data users need it, every year, not just once in ten years. Communities can use the data, to track the well-being of children, families, and the elderly; determine where to locate new highways, schools, and hospitals; show a large corporation that a town has the workforce the company needs; evaluate programs such as welfare and workforce diversification; and monitor and publicize the results of their programs (U.S. Census Bureau 2003, 2).

The concept underlying the ACS suggests that it has strong potential for adequately replacing and indeed improving upon the long form.

Edward Spar, Executive Director of the Council of Professional Associations on Federal Statistics, believes that annually updated census information will be highly valuable. He indicates that:

> The idea that I can look at household income distributions annually instead of having to use a model that I know will in just a few years bunch up the data at the high end inaccurately is very exciting. Or what about age data? Ever try to figure out how to move forward an age by sex distribution knowing that for rural areas out-migration for age is so sensitive that the odds that an 18 year old will hang around is very small? And forget about making annual estimates of migration for race and ethnicity. It's in this context that looking at annual information takes on a lot of excitement (2003).

Proponents argue that more accurate demographic data from the ACS will result in more appropriate and equitable distribution of federal funds, one of the key considerations in this discussion. According to John Spotila, Administrator, U.S. Office of Information and Regulatory Affairs,

> A large percentage of funding formulas distribute money to states and localities. If fully implemented, the ACS would provide, beginning in July 2004, for more current data for use in these formulas. For example, the Community Development Block Grant program provides funding to state and local governments for decent housing and expanded economic opportunity, primarily for low and moderate income people. The Federal funding formulas for this grant program are based largely on an area's demonstration of sub-standard housing conditions and a population in poverty. The necessary data come from the income and housing questions on the most recent census long form. Because conditions in some communities change rapidly, having current data is critical to identifying the most deserving communities. This is just one example of the potential uses and benefits of ACS data (U.S. Congress 2000, 25).

According to U.S. Representative Dan Miller, who chaired the Congressional subcommittee on the census in 2000, "Today we are here to begin the process of eliminating the problematic census long form" (U.S. Congress 2000, 1). His statements at a hearing in this regard focused on the privacy concerns of Americans contributing to an increasing resistance to the long form. The

predicted benefits of using ACS field staff include that they will be better trained enumerators who will be there to explain to local communities how the ACS benefits them (Taeuber 2000). Because of this, the ACS "has not encountered the kind of resistance from respondents that the census long form has engendered" (Taeuber 2000, 4).

Of paramount concern in any survey is achieving an adequate response rate. Those who have examined the ACS believe that response rates for the ACS will generally be comparable to that of the long form. Hough and Swanson have been evaluating the ACS since testing started in Multnomah County, Oregon, in 1996 and conclude that "the mail return rates of the 1996 ACS to the 1990 mail return rates of the census long form…are virtually the same" (1998, 295). Data released by the census bureau for their ACS test sites reveal that overall they achieved an average response rate of 96.5 percent in testing conducted from 2000 to 2002 (U.S. Census Bureau 2003, 2).

In addition, by virtue of its use of permanent, trained interviewers and a different non-response follow-up strategy, the ACS may be more effective in retrieving information from respondents who do not mail their surveys back. Salvo and Lobo are in the midst of conducting an evaluation of the ACS testing in Bronx County, New York. According to them, "Sampling variability issues notwithstanding, the higher level of data quality inherent in better ACS nonresponse follow-up represents a major advance over the increase degradation of long form census response" (2002, 11).

Some believe that updating census information annually has the potential to open up new possibilities for using data. According to Taeuber:

> Researchers are considering how the updated trends provided by the ACS can be used to improve needs assessment, predictive models, and estimates of characteristics such as disability and poverty. Geographic Information Systems (GIS) can use the current population and housing information to help community officials monitor and evaluate programs (2000, 4).

Finally, decoupling the long form from the short form may yield a more efficient decennial census and an improved population enumeration because less temporary census enumerators will be needed and they will be able to focus solely on the short from (Spar 2003).

The most important reason for skepticism regarding the ACS appears to be related to sampling, for small population areas and rural America as a whole. The overall ACS annual sample will be three million housing units, which is approximately one-seventh the size of the long form sample (HUD 2002). According to HUD, "the smaller sample size will mean that estimates based on annual ACS data will be less precise than those based on the long form at every level of geography" (2002, 6). Hough and Swanson express similar concern (1998).

Because the ACS will require that areas with smaller populations accumulate information over multiple years to build a reliable sample, they will consequently begin to receive ACS data later than their more populous counterparts (e.g. if implementation began today, most rural Wisconsin and Montana communities would not receive their initial ACS data until 2009, whereas places like Milwaukee and Flathead County would receive 2004 data in 2005).

Salvo and Lobo have found that the percentage of Bronx County households mailing back their questionnaires is uniformly lower in the ACS than in the 1990 census. This is a reason for concern, as it could mean higher levels of cost and sampling variability in hard-to-enumerate and smaller areas, because of the necessity for ACS staff to follow up via telephone and/or in person (Salvo and Lobo 2002). The ACS Operations Plan calls for the implementation of a design modification in 2005 to increase Computer Assisted Personal Interviewing (CAPI) subsampling rates in areas that traditionally have low mail response rates, which could ameliorate these concerns to some degree (Diffendal 2004).

The uncertain nature of program funding is another important reason for concern. According to Spar, "Given the stakes – a potential loss of the long form in 2010 – the user communities should be cautious" (2003). As alluded to, full federal funding of the ACS appears on track, but remains vulnerable. Spar and others believe, however, that the potential of the ACS will outweigh such concerns.

In Oneida and Vilas Counties in northern Wisconsin, Lake and Flathead Counties in northwest Montana, ACS pilot testing began in 1999. The Census Bureau selected pilot counties that could present unique complications in data collection and estimation. These complicating factors include: the size of the county's population, the population in areas classified as hard to enumerate (based on mail response rates in the 1990 census), and the speed of growth or decline in population since 1990 (Bench 2003).

For the pilot counties, thirty-six months of pooled ACS samples are intended to provide estimates of social and economic attributes of the household population with statistical precision roughly equal to the census long form estimates at the county and census tract levels. The 2000 census data for households and thirty-six months of pooled ACS data centered on 2000 makes comparative analyses of these test sites possible.

C. Description of Subject Counties

Vilas and Oneida Counties

Vilas and Oneida counties are situated in Wisconsin's fabled Northwoods. Rich in environmental amenities such as forests, rivers and lakes, the counties have been tourist destinations for vacationers from metropolitan areas to the south – Madison, Milwaukee, and Chicago – and west – Minneapolis/St. Paul – since the 1920s (Wirtz 2002). In the latter two decades of the 19th century and early 20th century, these counties shared the fate of most of the Upper Great Lakes region as they were heavily logged by timber companies eager to provide lumber, fencing, railroad ties and other forest products to expanding Midwest cities, towns and rural farming areas. As the timber companies moved west in the first quarter of the 20th century, and as farming failed to find a strong foothold in these northern counties, the region entered a period of economic stagnation and population decline. Oneida and Vilas counties witnessed slow growth during the first half of the century and then saw rapid population expansion in the late 1960s and into the 1970s as retirement migration to this part of the state began to accelerate. Since the first documented encounter with Europeans in 1745 and earlier, the Lac du Flambeau Band of Lake Superior Chippewa Indians has lived on the land that now comprises the Lac du

Flambeau Indian Reservation, the majority of which is in southwestern Vilas County (Great Lakes Intertribal Council 2003). This sizeable American Indian population adds to the unique character of this region

Today Vilas and Oneida Counties remain predominantly rural with relatively small populations – Oneida County grew 16 percent in the 1990s, resulting in a population of 36,776, while the population of Vilas County grew 19 percent in the last decade and now stands at 21,033 (U.S. Census Bureau 2003, 1; U.S. Census Bureau 2003, 4). Rhinelander, the Oneida County Seat, with a population of 7,735, is the largest community in either county. Both counties continue to grow at rates higher than the state average, primarily due to migration. In fact, Vilas County's growth during the 1990s was entirely due to migration, and its increase was nearly triple that of the 1980s (State of Wisconsin Department of Workforce Development 2003). Both counties experience large seasonal population fluctuations as summer residents swell the population. According to the 2000 census, seasonal housing units comprise 56.7 percent of all housing units in Vilas County and 39.1 percent of housing units in Oneida County, as illustrated in Figures 1 and 2 (U.S. Census Bureau 2003, 1). The counties also have relatively older population structures – Vilas is considered a "retirement-destination county" by the USDA Economic Research Service – and are characterized today by economies geared largely to retail trade and services.[2] This older population structure is due in part to a significant inmigration of retirees to seasonal lakefront property in recent years (Shields, Deller, and Stallman 1998). Improved infrastructure, such as a four-lane highway connecting Chicago to Wausau that is now only 20 miles short of the Hazelhurst/Minocqua/Woodruff area straddling the Oneida/Vilas border, has helped increase tourism, recreation, and development (Wirtz 2002). "Our biggest marketer is the Department of Transportation," according to Al Hanley, executive director of the Minocqua-Arbor Vitae-Woodruff Chamber of Commerce (Wirtz 2002). Real estate buying pressure in the area has also grown steadily, despite the downturn in the economy, and prices continue to rise. This trend may eventually slow the migration of retirement-age individuals to the area.

[2] A "retirement-destination county" is one that experienced 15 percent or more inmigration of people age 60 and older in the 1980s.

Figure 1

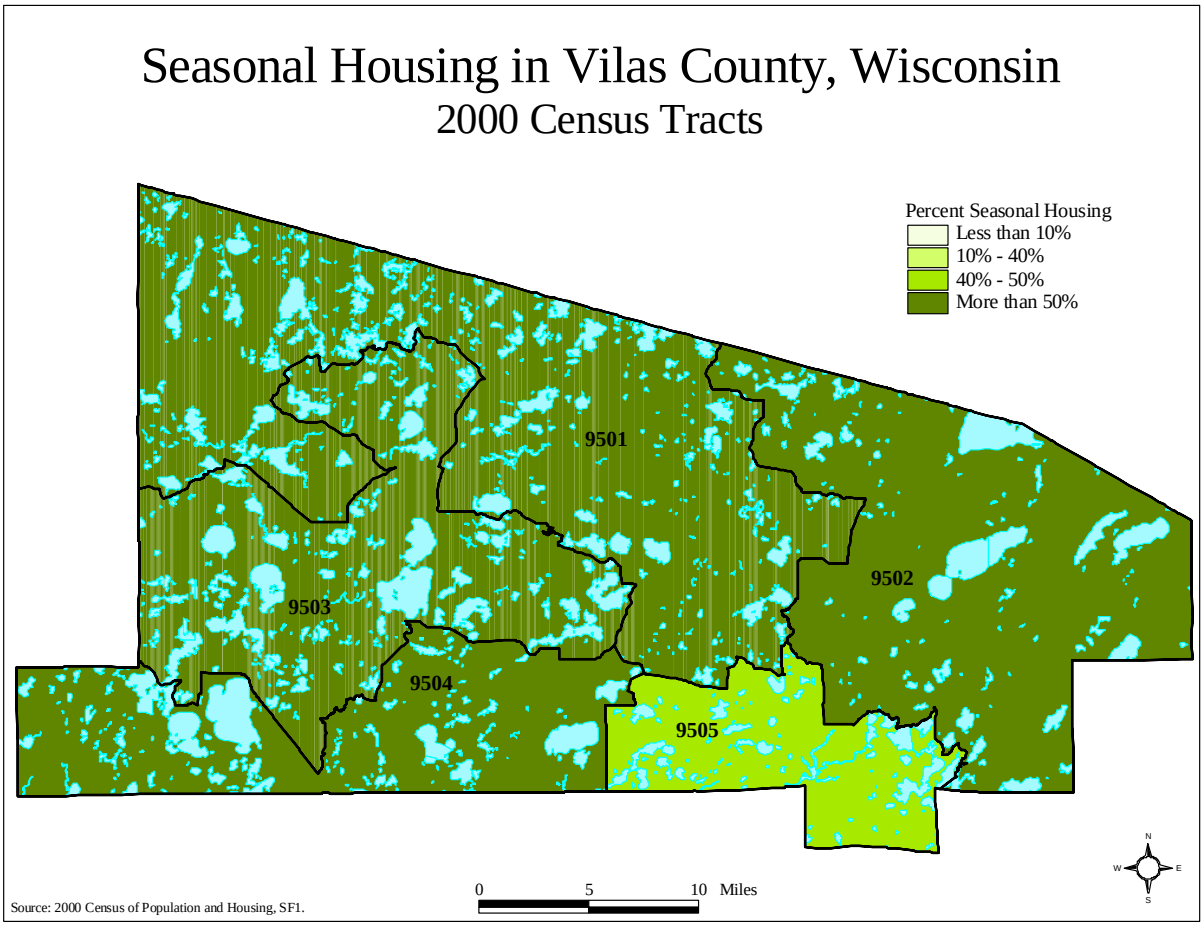
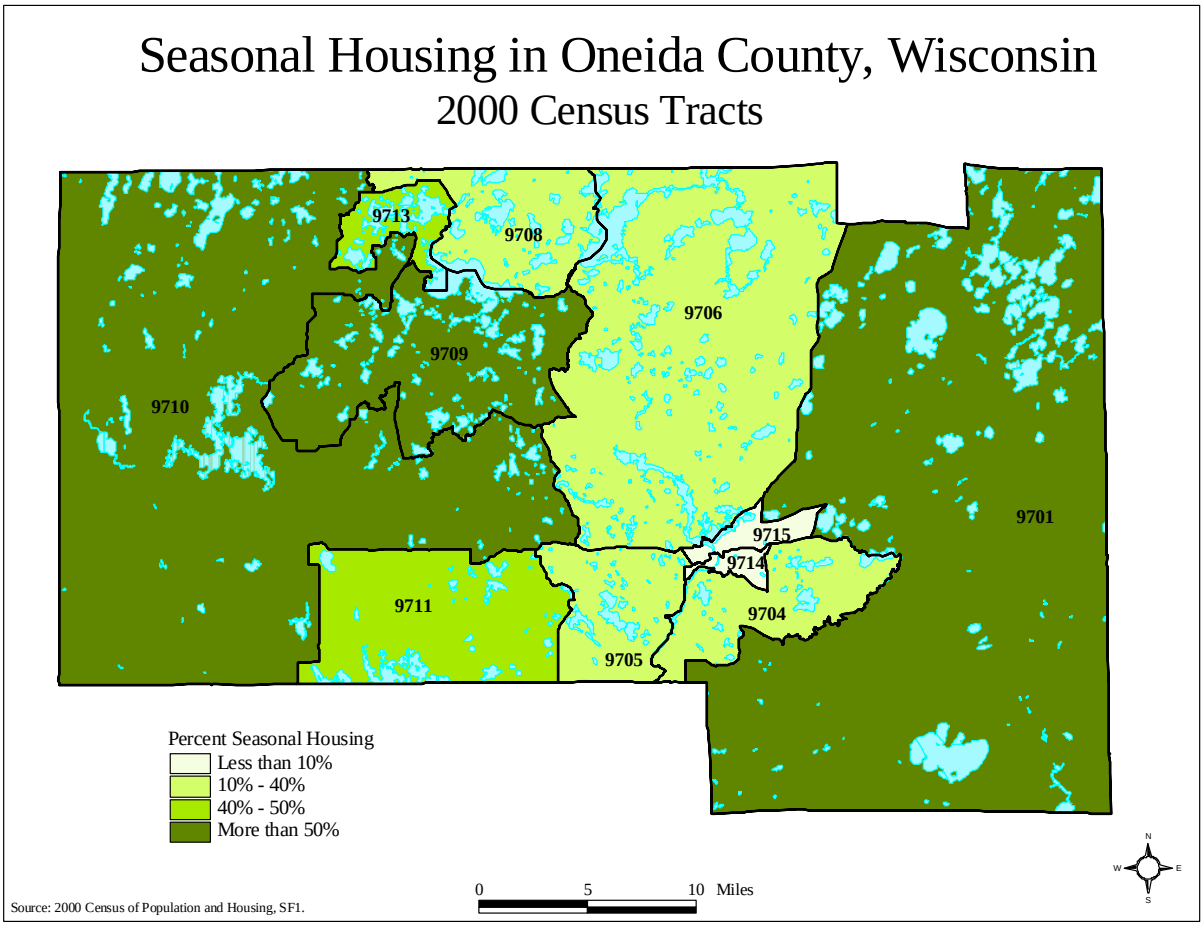

Seasonal Housing in Vilas County, Wisconsin
2000 Census Tracts
Percent Seasonal Housing
Less than 10%
10% - 40%
40% - 50%
More than 50%
9501
9502
9503
9504
9505
0
5
10 Miles
N
W
E
S
Source: 2000 Census of Population and Housing, SF1.

Figure 2



Flathead and Lake Counties

Like Vilas and Oneida Counties in Wisconsin, Flathead and Lake Counties, located in northwest Montana, have traditionally functioned as vacation and retirement destinations. Flathead Lake – the largest freshwater lake in the Western U.S. – exerts a moderating influence on the local climate allowing the cultivation of stone fruit orchards, especially cherries, not grown in other parts of the state, and enhancing the area's natural amenities.

Approximately 94 percent of Flathead County's 5,098 square miles are national or state forest, wilderness, agricultural, and corporate timber land. Flathead County encompasses much of the 1 million-acre Glacier National Park and its 700 miles of hiking trails and the 1.5 million-acre Bob Marshall/ Scapegoat/Great Bear wilderness complex, the largest designated roadless area in the contiguous 48 states. There are also a number of major recreational amenities, including two downhill ski resorts, eight golf courses, and Hungry Horse Reservoir. With the abundance of recreational opportunities and aesthetic values, Flathead County is among the fastest growing in Montana. It is the state's fourth most populous county and the most populous nonmetropolitan county (U.S. Census Bureau 2003, 1). There are three incorporated places in the County,

Kalispell, the county seat, is the largest with a population of 14,223, followed by Whitefish, population 5,032 and Columbia Falls, population 3,645 (U.S. Census Bureau 2003, 1). Countywide, the population increased from 59,218 in 1990 to 74,471 in 2000, a 26 percent increase in a decade (U.S. Census Bureau 2003, 1 and U.S. Census Bureau 2003, 4). Attraction development, such as water parks and helicopter tours, has greatly increased in recent years contributing to the influx of tourists and further shifting the economic base towards recreation and tourism (Flathead County Planning and Zoning Office 2002). Due to its amenities, Flathead County's population typically increases substantially during the months of June, July, and August (Flathead County Planning and Zoning Office 2002). At the time of the Census 2000 enumeration, 10.3 percent of Flathead County's housing units were vacant and intended for seasonal occupancy, as illustrated in Figure 3 (U.S. Census Bureau 2003, 1). Despite its small population, development pressure and limited zoning and planning have resulted in rural sprawl in Flathead County, particularly around Kalispell, which grew by more than 19 percent in the decade of the 1990s (U.S. Census Bureau 2003, 4).

Lake County contains the majority of Flathead Lake, part of the relatively small 74,000-acre Mission Mountains Wilderness, the National Bison Range, and the historic St. Ignatius Mission. The County is also home to the Confederated Salish and Kootenai Tribes of the Flathead Nation and the associated Flathead Indian Reservation, which was established by the Hellgate Treaty of 1855, lending yet another similarity to the Wisconsin ACS counties. The county was established in 1923 and was one of the last counties to be formed in Montana (Merril and Jacobson 1997). Lake County is Montana's ninth most populous, with 26,507 residents (U.S. Census Bureau 2003, 1). Polson, the county seat, is the state's 18th largest city with a 2000 population of 4,041(U.S. Census Bureau 2003, 1). Due in part to its natural amenities, Lake County grew by almost 20 percent in the 1990s (U.S. Census Bureau 2003, 1 and U.S. Census Bureau 2003, 4). While many counties in the rural West and Midwest have struggled, Polson has grown approximately 20 percent in each of the last two decades, despite being more than an hour's drive from the regional centers of Kalispell to the north and Missoula to the south (Wirtz 2002). Nearly 20 percent of Lake County's housing units are considered seasonal, as illustrated in Figure 4 (U.S. Census Bureau 2003, 1).

Figure 3

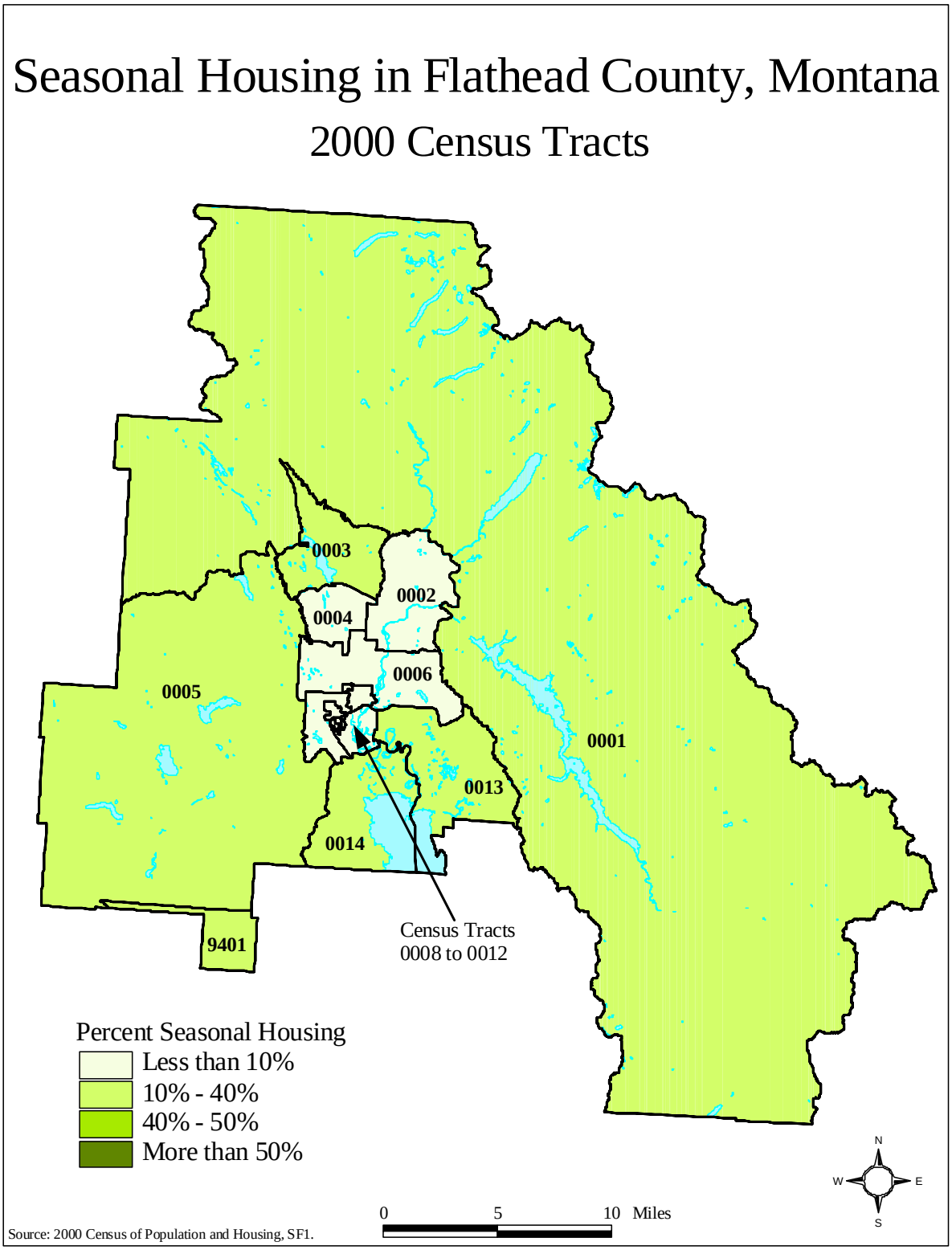
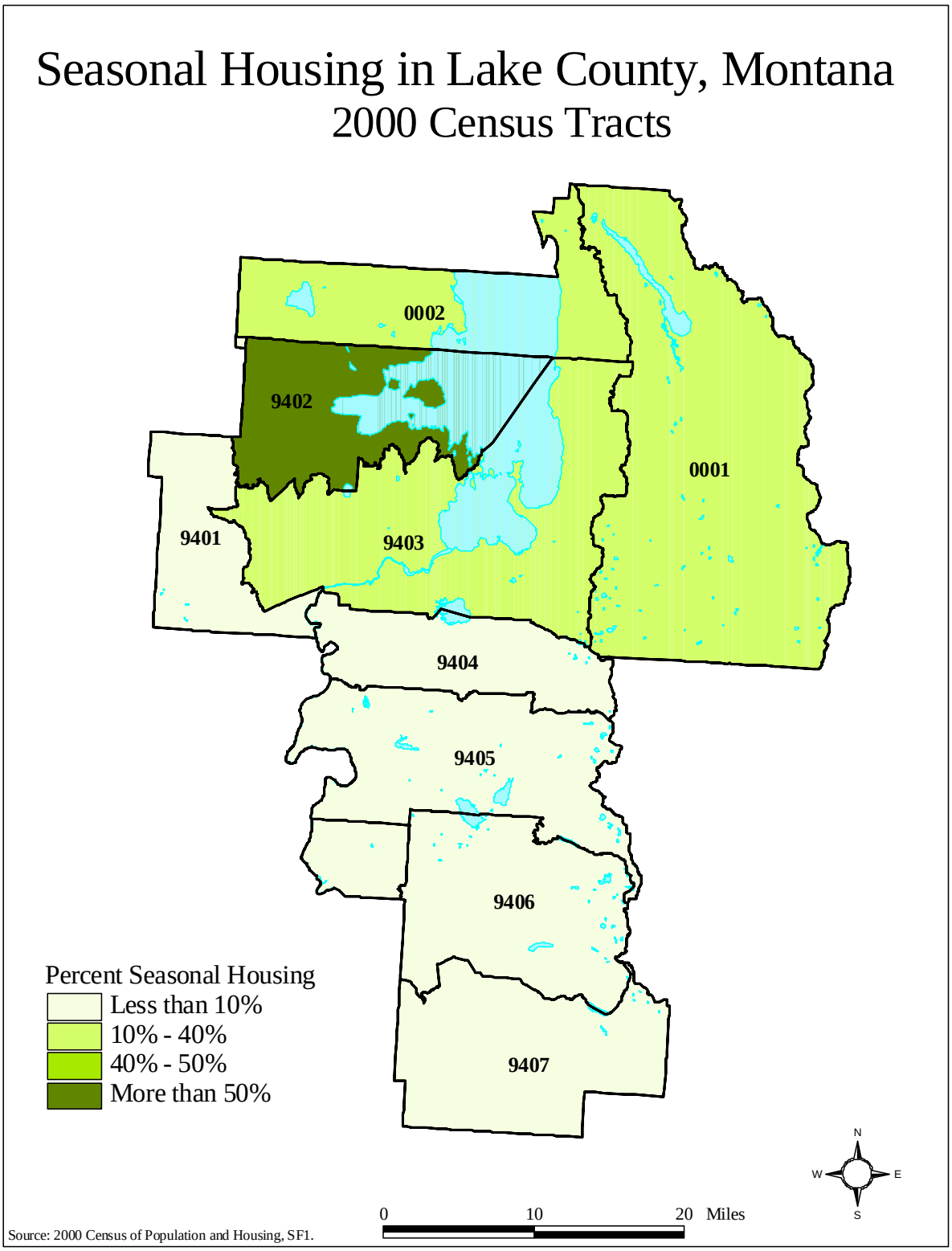

Seasonal Housing in Flathead County, Montana
2000 Census Tracts
0003
0002
0004
0006
0005
0001
0013
0014
9401
Census Tracts
0008 to 0012
Percent Seasonal Housing
Less than 10%
10% - 40%
40% - 50%
More than 50%
N
W
E
S
0
5
10 Miles
Source: 2000 Census of Population and Housing, SF1.

Figure 4


Seasonal Housing in Lake County, Montana
2000 Census Tracts
0002
9402
0001
9401
9403
9404
9405
9406
9407
Percent Seasonal Housing
Less than 10%
10% - 40%
40% - 50%
More than 50%
N
W
E
S
0
10
20 Miles
Source: 2000 Census of Population and Housing, SF1.

D. Purpose

The purpose of this report is to:

1. Assess the ACS attributes and quality measures at the county and tract levels of geography relative to the 2000 long form measures for each of the four counties;
2. Discuss the ACS's contribution to the demographic knowledge of these four counties;
3. Provide data users with a background to the ACS and a description of one approach to the analysis of this important issue; and,
4. Evaluate the adequacy of the ACS as a replacement for the 2010 census long form.

E. Basis of Analysis

1. Hypotheses

The analysis of the attribute data from the 2000 long form and three-year average ACS is framed around a primary hypothesis: the ACS will capture a portion of the seasonal population fluctuations in the four counties more effectively than the April 1, point-in-time, census enumeration. A more liberal residency rule and the rolling nature of the ACS make it more likely that a population that is important to these areas but generally excluded from the census will now be partly included in the ACS sample. We believe the ACS residency rule is a positive feature of the program design, for it has the potential to help the data paint a more accurate picture of areas with seasonal population fluctuations.

Specifically:

a. Our primary hypothesis suggests that the ACS will reflect the fact that these counties are recreation and retirement destinations experiencing natural amenity-led development.[3] The retirement-age populations of these counties is partially seasonal, which the ACS will more effectively capture.
    i. The ACS will demonstrate this retirement seasonality by portraying counties with populations that are older and wealthier with more occupied housing units, more owner-occupied units, fewer seasonal housing units, higher-priced housing units, smaller households, and more households with retirement income.[4] The ACS should also reveal a larger overall population, except for the fact that the 1999-2001 population estimates are controlled to Census 2000-based counts.

[3] Natural amenity-led development is residential and concomitant commercial and economic development driven by perceptions of aesthetics associated with specific regional characteristics related to land and water – trees, forests, open space, lakes, rivers, coastline, mountains, canyons, and hills (Marcouiller, Clendenning, and Kedzior 2002).
[4] Rural retirement counties – those nonmetropolitan counties with the significant net inmigration of retirement age individuals – have enjoyed more rapid population and employment growth, than other types of counties since the 1970s. According to Richard Reeder of the Economic Research Service of the USDA, "The influx of retirees is also associated with increased family incomes, reduced unemployment rates, and greater economic diversity in rural areas" (Reeder 1998). The Wisconsin Economic Impact Modeling System (WEIMS – Shields, Deller, and Stallman 1998) demonstrates an impact of 1.7 for inmigration of retiree households, i.e. an indirect increase in population equal to 1.7 times the number of new retiree households.

ii. Differences in the ACS and census residency rules partly account for the hypothesized population differences. The census used the usual residency rule, which stipulates that everyone is to be counted at their "usual residence," and usual residence is defined as the place where a person spends "most of your time." The ACS counts everyone who is staying at the sampled unit whose total length of stay will be more than two months duration (Love 2003, 1). Most seasonal residents would not have been counted as residents of these counties on April 1, as they would not have considered their seasonal homes as their usual residences. Of course many summer seasonal retirees have stays of under two months and, thus, would be excluded from the ACS sample as well.

b. While the non-retiree seasonal population is important in these counties as well, the authors believe that this population will mostly fall outside of the scope of the ACS due to their shorter lengths of stay. Most of this population would not be counted because they would live at their seasonal residence for less than two months.
c. The Wisconsin and Montana counties are similar in numerous ways, most notably having in common extensive rural areas, natural amenities, seasonal populations, and Native American populations. Because the Wisconsin counties have significantly higher rates of seasonal housing, however, we believe the ACS will demonstrate seasonality to a greater degree in Wisconsin, especially Vilas County (with 57 percent seasonal housing), and to a lesser degree in Montana, especially Flathead County (with only 11 percent seasonal housing).

2. Meaningful Differences

In order to explore meaningful differences between the pooled 1999-2001 ACS and the 2000 census related to the hypotheses described above, the authors developed an indicator matrix. A list of twelve socioeconomic attributes was compiled based on their relevance to the hypotheses and each county was analyzed with this matrix as the basis of comparison.

The specific indicators are listed below. For most of these attributes, the authors anticipated a difference between the census and the ACS in a particular direction, while for others, we were uncertain as to the direction due to factors described in Table 1.

Table 1 – Attribute Matrix

Indicator	Anticipated Direction of Difference in ACS
Population 62 and over	Higher – Due to seasonal retirement-age population counted by ACS
Median age	Higher – Due to seasonal retirement-age population counted by ACS
Householders 65 years and over	Higher – Due to seasonal retirement-age population counted by ACS
Average household size	Lower – Due to seasonal retirement-age population without children counted by ACS
Occupied housing units	Higher – Due to units occupied by seasonal retiree population counted by ACS
Owner-occupied housing units	Higher – Due to seasonal retirement-age population – that are more likely to be homeowners – counted by ACS
Education (Percent bachelor's degree or higher)	Uncertain – While seasonal retirement-age residents may be wealthier than the general population and therefore are also likely to be better educated, this population reached maturity in an era when completion of a college degree was not as common as it is today.
Unemployment (Percent Unemployed)	Lower – The seasonal retirement-age population would not directly affect unemployment because retired individuals would not be included in the civilian labor force, but the ACS is expected to measure lower unemployment due to the higher demand for services and therefore labor exerted by the seasonal population and vacationers.[5]
Not in labor force	Higher – Due to seasonal retirement-age population counted by ACS
Median household income	Uncertain – Research regarding the impact of an influx of retirees on the median income of an area is mixed.[6]
Population with retirement income	Higher – Due to seasonal retirement-age population counted by ACS
Median housing value	Higher – Due to seasonal retiree population with greater wealth counted by ACS[7]

[5] The Wisconsin Economic Impact Modeling System (WEIMS) demonstrates that the demand for services and other multiplier effects of the inmigration of retirement-age individuals has a negative impact on the unemployment rate (Shields, Deller, and Stallman 1998). We believe that the spending of vacationers may be a larger factor in this multiplier effect than retirees. As the needs of vacationers draw additional people into the workforce during the summer months, this effect should be picked up in the ACS attributes.

[6] While the WEIMS demonstrates that retiree inmigration results in lower per work earnings and per capita income due to the increase in lower wage service jobs this population shift engenders, other research claims that there is a positive correlation between such a population shift and family income (Reeder 1998). A mitigating factor in the case of the subject counties is that we believe that the seasonal retiree population is wealthier than the general population, and despite the majority of them most likely being out of the labor force, their retirement income may be sufficient to increase the median incomes of these rural areas.

[7] The WEIMS demonstrates that while new construction as a result of retiree inmigration is generally of higher value than existing stock, the numbers of new homes are not enough in the model to affect the overall housing value of the area (Shields, Deller, and Stallman 1998. The authors believe, however, that because of the high percentage of seasonal housing in the subject counties and relatively small populations, the ACS may reveal higher housing values.

E. Sampling and Enumeration Issues

The sampling plan for the ACS, introduced several years ago, over-sampled areas with small populations. To this point, the ACS has not achieved this initial goal as demonstrated in the Table 2.

Table 2 – Long Form and ACS Sample Sizes

County	2000 Long Form Population Sample Size	ACS (3-yr total) Population Sample Size	2000 Long Form Housing Unit Sample Size	ACS (3-yr total) Housing Unit Sample Size
Oneida	22.3%	11.6%	26.0%	9.1%
Vilas	36.7%	14.1%	37.1%	8.9%
Flathead	21.2%	12.8%	21.7%	12.2%
Lake	21.6%	14.4%	21.9%	13.8%

The 1999-2001 pooled ACS samples were all lower than those for the census long form in 2000. This has a strong impact on the statistical quality of the comparison between the two data sets. At these sampling rates, it would take nearly four and a half years for the ACS population sample to equal that of the 2000 long form in Lake County, six years in Oneida County, and nearly eight years in Vilas County. In Flathead County, it would take five years for the sample to reach the long form rate.

We are very concerned about the ACS sampling rates achieved to date in the subject counties. We understand, however, that the sampling design has been changed for Oneida and Vilas counties to ensure a larger over-sample beginning in 2002. The reasons for the existing sampling discrepancies and an explanation of the corrective taken by the Census Bureau were drafted by Alfredo Navarro of the Bureau's ACS Design Branch and are presented on page 19, and specific sample information prepared by Navarro is presented in Tables 3 and 4.

We are disappointed by the fact that Minor Civil Divisions (MCDs) data from the pooled ACS samples are not yet available for the ACS test sites. In rural counties such as these, the provision of ACS information for governmental units will be essential to the success of the ACS program. Census tracts are the smallest levels for which ACS data has been provided to date. In areas like Vilas County – with Eagle River (population 1,448) its only one incorporated community – data for census tracts are not particularly meaningful to local data users; census tracts are too large, in size and population, for residents to identify with them as communities. Many rural census tracts encompass large numbers of governmental units.

Differences in Sample Sizes 1999-2001 ACS vs. Census 2000 in Oneida and Vilas Counties, WI

There are two main reasons for the differences in sample sizes:

1. ACS did not use Minor Civil Divisions (MCDs) in determining the sampling rate.

2. ACS used the total housing unit count for a geography to determine the sampling rate, while Census 2000 used an estimate of the occupied housing units.

ACS did not use MCDs as design areas in 1999-2001 for determining the sampling rate. This was changed starting in 2002 data collection. It is an oversight on the part of the ACS sampling staff. For the most part, the small governmental units in Oneida and Vilas counties are MCDs. Since ACS did not use the MCD counts in determining the sampling rates, we did not oversample the areas that should have been. Thus, we have less sample than we should have had.

ACS used the total housing unit count for a governmental unit, while Census 2000 used an estimate of the occupied housing units for determining the sampling rate. ACS uses the count of housing units from the Master Address File (MAF) for determining the size of the governmental unit. Census 2000 used the count of housing units from the MAF, but multiplied this number by the occupancy rate from 1990 at the collection block level to determine the size of the governmental unit. Using occupied housing units will mean more areas will be oversampled. In the case of Oneida and Vilas counties their occupancy rates were 50.3% and 36.1% respectively from the 1990 Census. These low occupancy rates for the two counties and the fact that there are governmental units throughout the county implies that Census 2000 oversampled more areas than the ACS from 1999-2001.

There is another item that will affect the size of future ACS samples: the redrawing of tract boundaries. The Census Bureau after Census 2000 redrew the tract boundaries. In most cases the tracts became bigger in terms of total housing units. For Vilas county, there were 15 tracts in 1990 and all had less than 1700 housing units(Addresses), but in 2000 there are only 5 tracts and all have over 3200 HUs. How does this affect ACS? If a housing unit does not fall in a small governmental unit (less than or equal to 1200 Addresses) but falls into a large tract (more than 2000 Addresses), then the ACS will undersample (0.735 * base rate) that area. The 1999-2001 ACS used the 1990 Census tracts for determining sampling rates and in **2002** switched to the new 2000 tract definitions.

The following table compares the sample sizes for a 5 year ACS and what would occur for a long form in 2010 based on 2004 MAF housing unit counts. We also show the ACS using both total housing units and estimated occupied housing units for determining the sampling rate. We have also included the 1999-2001 designated sample (Note the “200-800 Addresses” row is really 0-800 Addresses for 1999-2001, since the sampling rate change was introduced in 2002) (Navarro 2003).

Table 3 - Differences in Designated Sample Sizes in Vilas and Oneida Counties

County	Strata	1999-2001	Sampling Rate Based on Total Housing Units		Sampling Rate Based on Occupied Housing Units		
			MAF Addresses	ACS Sample Addresses	MAF Addresses	ACS Sample Addresses	Census Sample Addresses
Oneida	0-200 Addresses	Did Not Exist	87	44	2,125	1,063	1,063
Oneida	200-800 Addresses	364	3,025	1,121	6,679	2,475	3,340
Oneida	800-1200 Addresses	186	5,409	1,002	9,222	1,708	2,306
Oneida	Large Tracts (>2000 Addresses)	1,358	12,235	1,111	2,071	188	259
Oneida	Everything Else	1,787	7,185	887	7,844	969	1,307
Oneida	Total	3,695	27,941	4,165	27,941	6,403	8,275
Vilas	0-200 Addresses	Did Not Exist	0	0	0	0	0
Vilas	200-800 Addresses	228	1,499	555	13,060	4,839	6,530
Vilas	800-1200 Addresses	60	2,832	525	6,951	1,288	1,738
Vilas	Large Tracts (>2000 Addresses)	0	18,130	1,646	2,122	193	265
Vilas	Everything Else	3,073	1	0	329	41	55
Vilas	Total	3,361	22,462	2,726	22,462	6,361	8,588

While the sampling strategy presented in Table 3 should produce improved samples in the future, there remains some reason for concern. The predicted size of the ACS sample for Oneida and Vilas Counties would be 77 percent and 74 percent of the long form sample, respectively. According to the Census Bureau, these sample sizes would be in-line with the rate anticipated by the Bureau; nationally, the ACS will select roughly 2.5 percent of the "initial sample addresses," or about 12.5 percent over five years, compared to 16.7 percent in the 2000 long form (Hubble 2003). In terms of initial sample addresses, therefore, the Census Bureau expects the ACS to achieve a sample that is about 75 percent of the long form sample (Hubble 2003). Add to this the fact that in the ACS only 75 percent of cases that do not respond to the mail survey or telephone follow-up will be contacted by personal interview, the overall ACS "interviewed" sample size is expected to be only 56 percent of the long form (Hubble 2003). This problem will be especially acute in rural areas with non-city addressing structures.

The ACS is simply designed to sample a much smaller portion of the population than the long form. Perhaps more importantly, while the majority (thirteen of twenty-one) municipalities in Oneida County will be over-sampled MCDs based on the formula described above, this will be

true for only one-third of the municipalities in Vilas County – five of fifteen (DOA 2003) – meaning that most of Vilas County will not be over-sampled. Given these factors, it remains to be seen whether ACS sampling as designed by the Census Bureau will provide reliable enough data for it to effectively replace the long form.

Differences in Sample Sizes 1999-2001 ACS vs. Census 2000 in Flathead and Lake Counties, MT

Alfredo Navarro also provided further details on the sampling situations in our Montana counties, as presented in Table 4.

Table 4 – Differences in Designated Sample Sizes in Flathead and Lake Counties

County	Strata	ACS 99-01 Sample Addresses	MAF Addresses Based On Total HU	ACS Sample Addresses Based On Total HU	MAF Addresses Based On Occ HU	ACS Sample Addresses Based On Occ HU	Cen Sample Addresses Based On Occ HU
Flathead	0-200 addresses	Did not exist	47	24	47	24	24
Flathead	200-800 addresses	2,057	5,316	1,970	6,967	2,581	3,484
Flathead	800-1200 addresses	568	1,651	306	0	0	0
Flathead	large tracts	2,870	25,363	2,302	17,312	1,571	2,164
Flathead	everything else	419	4,328	535	12,379	1,529	2,063
Flathead	total	5,914	36,705	5,137	36,705	5,705	7,735
Lake	0-200 addresses	Did not exist	100	50	476	238	238
Lake	200-800 addresses	1,487	2,081	771	2,509	930	1,255
Lake	800-1200 addresses	172	1,488	276	1,556	288	389
Lake	large tracts	794	4,687	425	4,687	425	586
Lake	everything else	297	5,296	654	4,424	546	737
Lake	total	2,750	13,652	2,176	13,652	2,427	3,205

Notes:

- Computed using base rate = 0.0247
- The "ACS 99-01 Sample Addresses" figures are based on the 1990 Census Tracts definition and MCD's were not treated as governmental units.
- All other figures were computed using the 2000 Census Tracts definition and treating MCD's as governmental units.
- The figures computed in the last three columns are based on the projected number of occupied housing units.

Regarding the analysis of quality measures, there were enumeration issues that may complicate direct comparison of the ACS and long form data. Often, response rates cannot be compared because the ACS was conducted using mailout/mailback and the census was not mailout/mailback in most areas of these counties. For the ACS, respondents are first contacted via mail. Non-respondents are returned to the sample pool in the second month and receive a follow-up phone call. Of the remaining non-respondents after the telephone follow-up, ACS staff randomly choose one-third of the addresses with which to follow up in-person. The in-person responses are used to represent the other two-thirds that did not respond. Table 5 presents the 2000 long form enumeration method for each subject county (maps presented in Appendix C show the type of enumeration method used for each census tract in the study):

Table 5 – 2000 Long Form Enumeration Methods

County	Enumeration Method
Oneida	Primarily "List or Update/Enumerate," some "Update/Leave"
Vilas	Entirely "List or Update/Enumerate"
Flathead	Primarily "Update/Leave," "Mailout/Mailback" and "List or Update/Enumerate" for two small areas
Lake	Primarily "List or Update/Enumerate," some "Update/Leave"

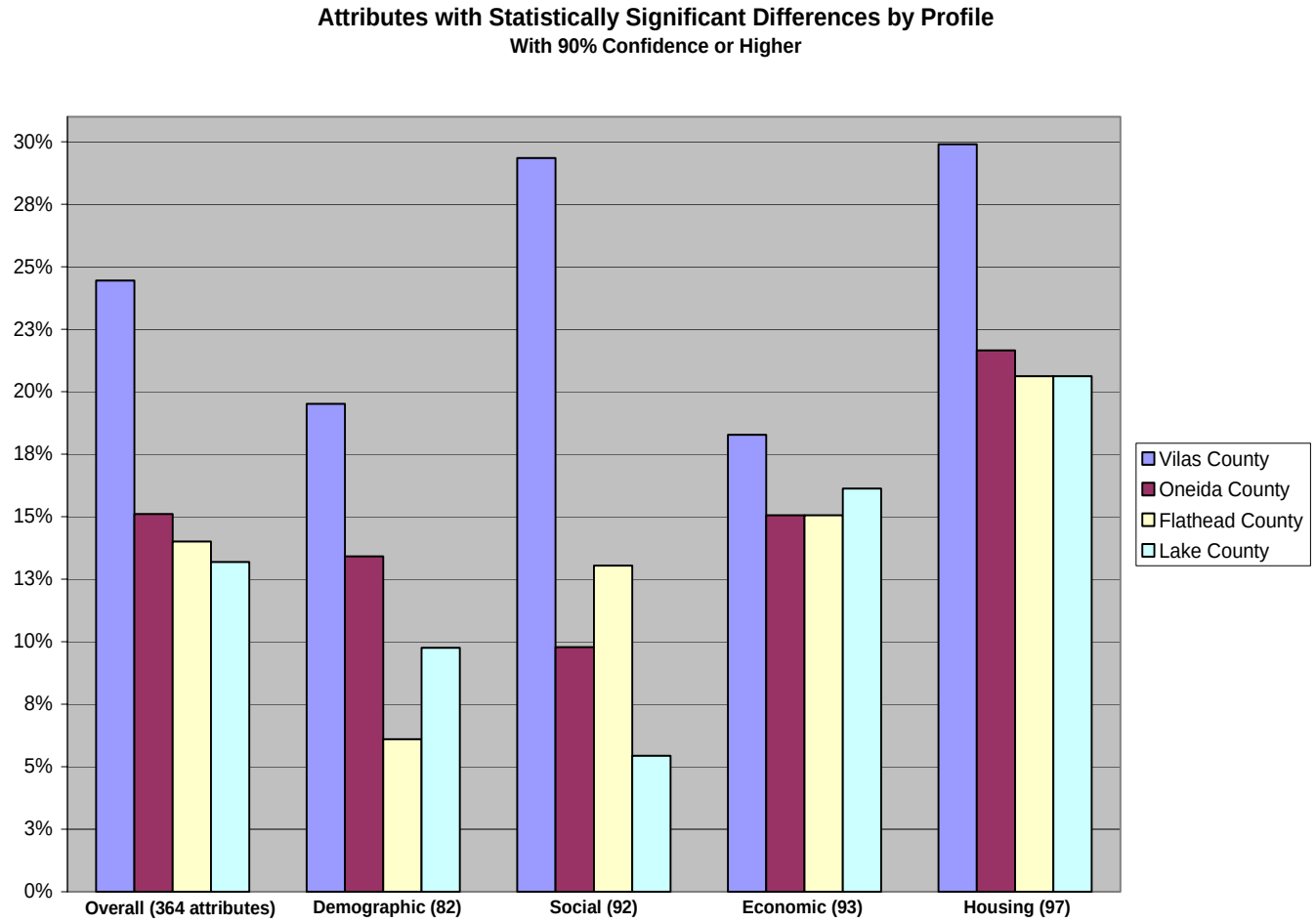
There clearly were a wide variety of enumeration methods employed in obtaining the U.S. Census data for these four counties, and the method for following up with nonrespondents also differed significantly from the ACS. These sampling and enumeration issues must be kept in mind when considering the actual analysis of the data.

II. Attribute Analysis

A. Overall Summary

The results discussed in this part of the report derive from a comparison of the ACS three-year average and 2000 long form data for the 364 common attributes provided by the Census Bureau. A summary of this analysis is found in Figure 5.

Figure 5



As is made apparent in Figure 5, there was a substantial degree of difference between the 2000 long form and three-year average ACS data in regards to the characteristics of the subject counties they revealed. In Vilas County, 24.5 percent of the attribute data was significantly different, while in Lake County – the county with the most agreement between the ACS and long form – 13.2 percent of the attribute data was significantly different. Clearly, there was statistical agreement for the majority of the attributes of the ACS and long form, but we find the level of difference to be worthy of note and further investigation. Each of the counties exhibited a sizeable difference in economic and housing attributes – more than 20 percent of the items were significantly different in all counties – perhaps the areas of most concern to the data users.

B. Meaningful Differences Summary

We attempted to uncover statistical differences that are meaningful to our hypothesis by using the 12 indicators from the attribute matrix described in Section I, Part D2. Table 6 summarizes the results at the county level, along with the percentage of seasonal housing in each county.

Table 6 – Meaningful Differences at County Level

Indicator	Vilas	Oneida	Flathead	Lake
Seasonal Housing	56.7%	39.1%	10.3%	19.8%
Pop 62+ (H)	-	-	-	-
Med Age (H)	-	-	-	-
HH65 (H)	-	-	-	H***
Avg HH Size (L)	L***[10]	L*** [8]	-	-
Occ HU (H)	H***	H***	-	-
Own-Occ HU (H)	-	-	H**[9]	H**[11]
% Bach Deg (U)	H***	-	-	-
Unemp Rate (L)	H*	-	-	-
Not In Lab For (H)	-	-	-	-
Med HH Inc (U)	H*	H** [10]	-	H***
With Ret Inc (H)	H**	H*	H** [11]	-
Med Hsng Val (H)	H***	-	-	-

LEGEND:

- *Attribute Abbreviations:*
  - *Pop 62+ = Population 62 and over*
  - *Med Age = Median age*
  - *HH65 = Householders 65 years and over*
  - *Avg HH Size = Average household size*
  - *Occ HU = Occupied housing units*
  - *Own-Occ HU = Owner-occupied housing units*
  - *% Bach Deg = Percent bachelor's degree or higher*
  - *Unemp Rate = Unemployment Rate (Percent Unemployed)*
  - *Not In Lab For = Not in labor force*
  - *Med HH Inc = Median household income*
  - *With Ret Inc = With retirement income*
  - *Med Hsng Val = Median Housing Value*
- *H = Higher, L = Lower, U = Uncertain*
  - *Refers to the difference in the attribute (Census minus ACS)*
  - *H, L, or U in parenthesis indicates the expected direction*
- *Significant at p <= 0.01 level = ****
- *Significant at p<= 0.05 level = ***
- *Significant at p<=0.1 level = **
- *No significant difference = -*

Note: All analysis is based on Proportions unless otherwise indicated as being Averages or Medians

[8] While AHH is not significantly different, Average Family Size and Average Household Size of Owner Occupied Units – both related indicators – are, and are therefore referenced here.
[9] While OOHU is not significantly different, related indicator Specified Owner Occupied Unit is, and is therefore referenced here.
[10] While MHI is not significantly different, related indicator Median Family Income is, and is therefore referenced here.
[11] While WRI is not significantly different, related indicator With Social Security is, and is therefore referenced here.

Overall, the Wisconsin counties have more attributes demonstrating a meaningful difference between the ACS and 2000 long form than the Montana counties. These results are consistent with our hypotheses, as the number of meaningful differences in an area appears to correspond with the percentage of seasonal housing located therein. While we were undecided about the direction in which we expected median household income to differ, the results support the idea that the ACS will demonstrate higher incomes in seasonal areas at the county level.

C. Vilas County

The ACS data appeared to be most successful in capturing characteristics of seasonality and support for the primary hypothesis in Vilas County. Based on the high level of seasonal housing in Vilas County, the authors were not surprised by this and note that it supports their hypotheses. The ACS revealed the greatest number of meaningful differences in Vilas County, and all but one of these differences were in the expected direction. The unemployment rate in Vilas County was higher in the ACS, which was contrary to the anticipated direction. Vilas County is also the one county where median housing value was significantly higher in the ACS data compared to the long form. Because Vilas County is considered a USDA-ERS retirement-destination county, one might have expected to see a statistically significant increase in the median age and population of retirement age people in Vilas County from the long form to the ACS, but this was not the case, and this was perhaps due to the population estimates being controlled.

It is our belief that the reason we see proportionately more statistically significant differences between the long form and ACS in Vilas County is the very high percentage of seasonal housing in Vilas County. Part of the difference may be attributable to sampling error; there was a sizable difference between the long form and three-year ACS sample, and Vilas County had the lowest housing unit sampling rate of the four counties. The fact that most of the differences at the county and tract level were in the expected direction, however, seems to indicate that these are actual differences in data, supporting our hypothesis. The meaningful differences in Vilas County census tracts are summarized in Table 7.

Table 7 – Vilas County Meaningful Differences

Indicator	950100	950200	950300	950400	950500
Seasonal Housing	73.3%	55.7%	61.7%	50.4%	41.4%
Pop 62+ (H)	-	-	-	-	-
Med Age (H)	-	-	-	-	-
HH65 (H)	-	-	-	-	L*
Avg HH Size (L)	-	-	-	L*	-
Occ HU (H)	-	-	H***	H***	H*
Own-Occ HU (H)	-	-	-	-	-
% Bach Deg (U)	-	-	H**	H**	-
Unemp Rate (L)	-	-	-	-	-
Not in Lab For (H)	H*	-	-	L**	-
Med HH Inc (U)	-	-	-	-	-
With Ret Inc (H)	H**	-	H*	-	-
Med Hsng Val (H)	-	H***	-	-	-

D. Oneida County

Our analysis of the county and tract level attributes suggests that the ACS was successful in capturing characteristics of seasonality and support of the primary hypothesis of this report in Oneida County to a certain degree, but less so than in Vilas County. This was somewhat to be expected, given that Oneida County has less seasonal housing than Vilas County and features the largest city in the region, Rhinelander.

There were relatively few attributes for which meaningful differences were revealed, and in some cases there were significant differences in an unexpected direction. For occupied housing units, for example, the ACS data did indeed show a significantly greater number for Oneida County overall and in several of its census tracts individually, supporting the hypothesis. However, there were actually significantly fewer occupied housing units in the ACS data for one individual census tract (970800). Median value of housing was significantly lower in the ACS in one Oneida census tract (970900).

The meaningful differences in Oneida County census tracts are presented in Table 8.

Table 8 – Oneida County Meaningful Differences

Indicator	970100	970400	970500	970600	970800	970900	971000	971100	971300	971400	971500
Seasonal Housing	56.0%	20.9%	23.8%	36.4%	38.6%	54.4%	53.5%	45.2%	42.9%	1.9%	1.5%
Pop 62+ (H)						H*[12]					
Med Age (H)										H**	
HH65 (H)											
Avg HH Size (L)			L*							L*	
Occ HU (H)	H***		H***	H***	L**			H***		H***	H**
Own-Occ HU (H)			H***						L*		
% Bach Deg (U)								H**[13]	L**		L**
Unemp Rate (L)	L**										
Not In Lab For (H)										L*	H***
Med HH Inc (U)		H*									
With Ret Inc (H)	H*										
Med Hsng Val (H)						L**					

[12] Although P62 was not significantly different, Population 65 Years and Over, an equivalent indicator, was.
[13] Although %BD was not significantly different, the proportion of people with Bachelor's Degrees, an equivalent indicator, was.

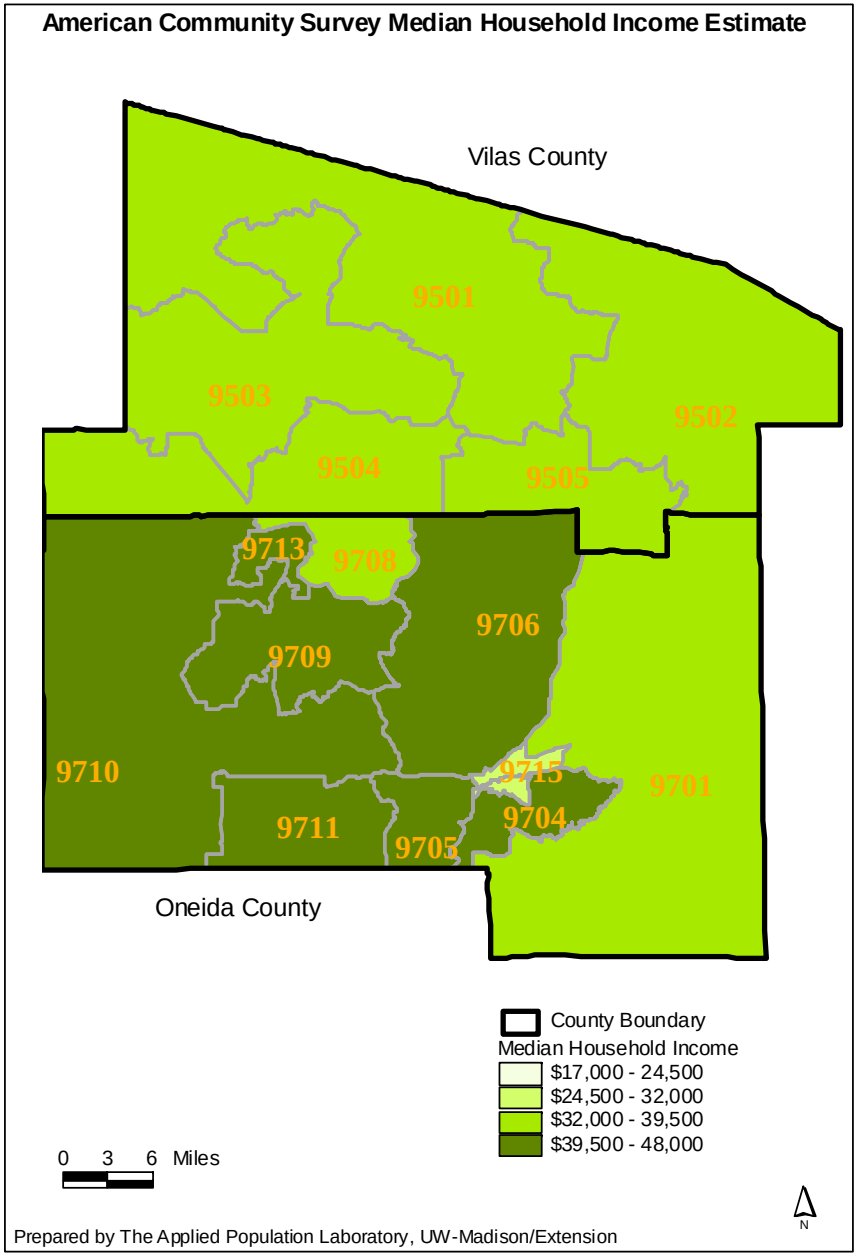
Interestingly, Tract 971400, which has the second-lowest level of seasonal housing, had the most meaningful differences in Oneida County, and all in the anticipated direction. Tract 970100 – the tract with the highest level of seasonal housing – had several meaningful differences, all in the expected direction, which would support the hypothesis. As with Vilas County, while the level of meaningful differences suggest support for our hypotheses, the level of sampling error may obfuscate accurate interpretation.

Absolute differences between ACS and long form estimates for certain economic and housing attributes from the matrix in Vilas and Oneida Counties are illustrated in Figures 6-10. While not all were statistically significant, there were clearly a number of disagreements between the ACS and long form in the census tracts of these counties. There are particularly stark differences for the attributes unemployment rate and with retirement income.

Figures 6-10 illustrate the meaningful differences between ACS and 2000 long form estimates in Vilas and Oneida Counties.

Figure 6

Wisconsin Counties Median Household Income



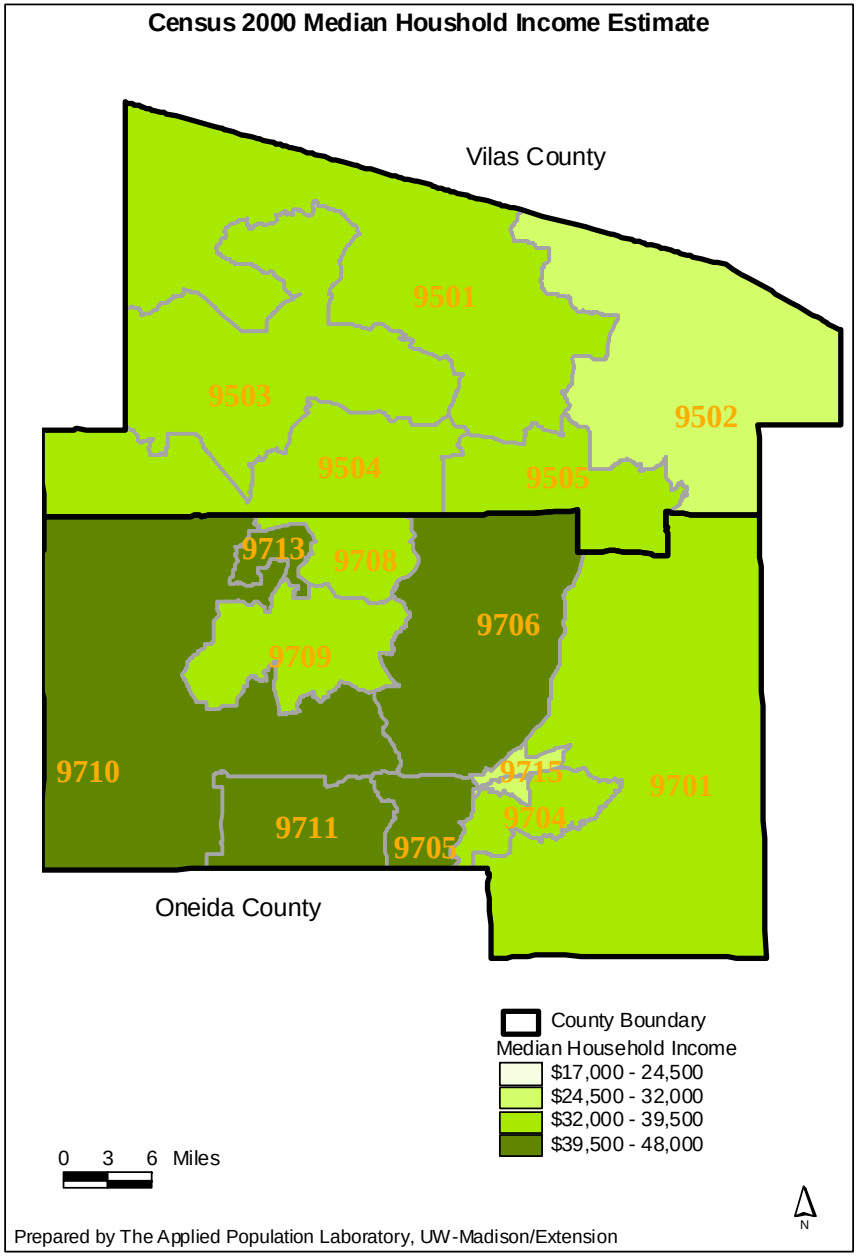
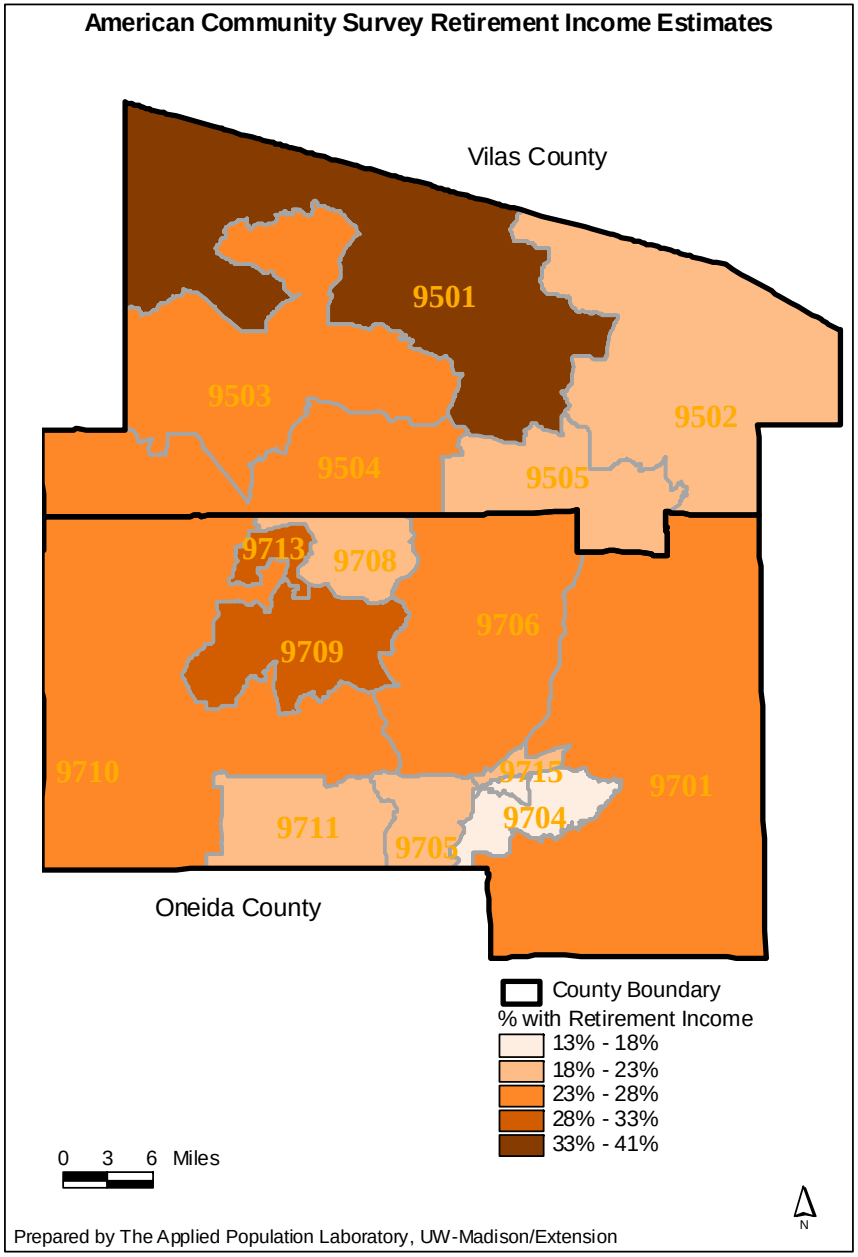


Figure 7

Wisconsin Counties Retirement Income



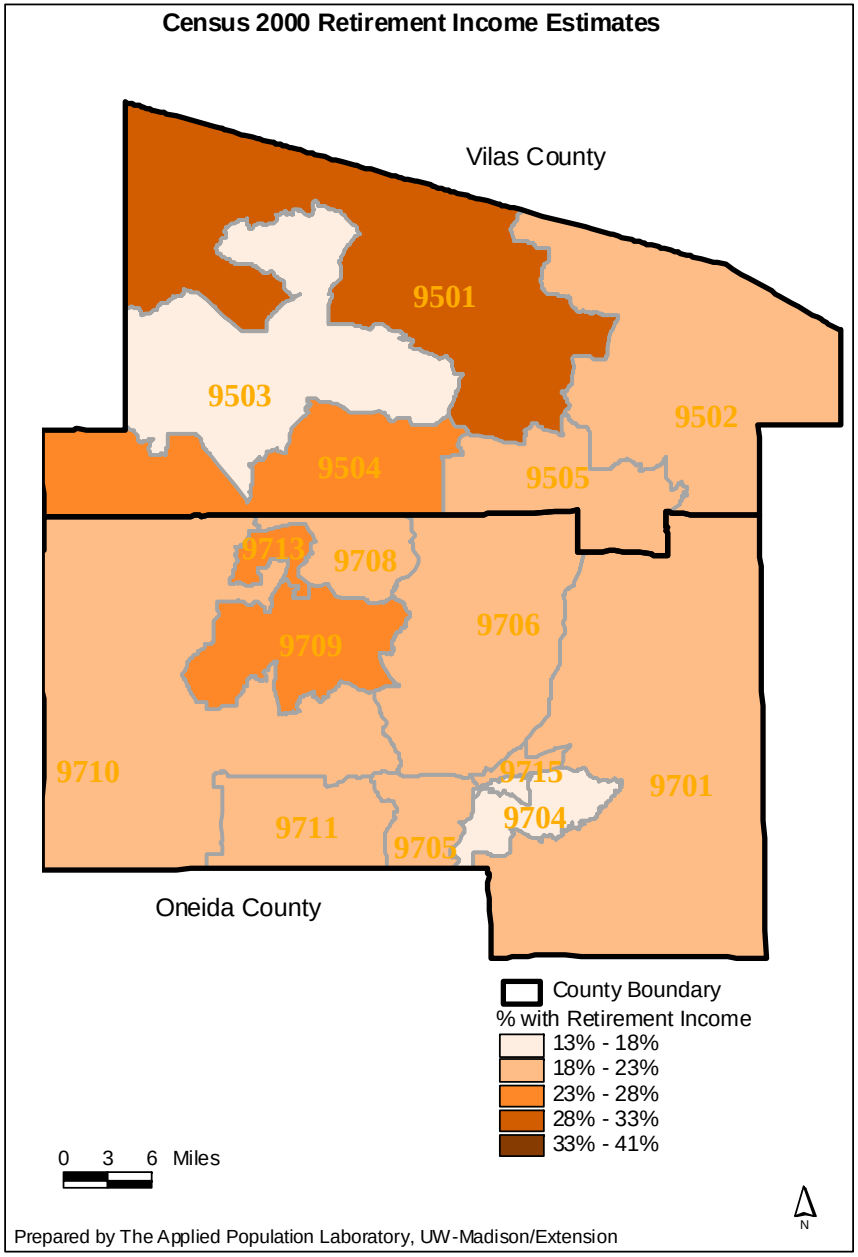


Figure 8

Wisconsin Counties Unemployment Rate

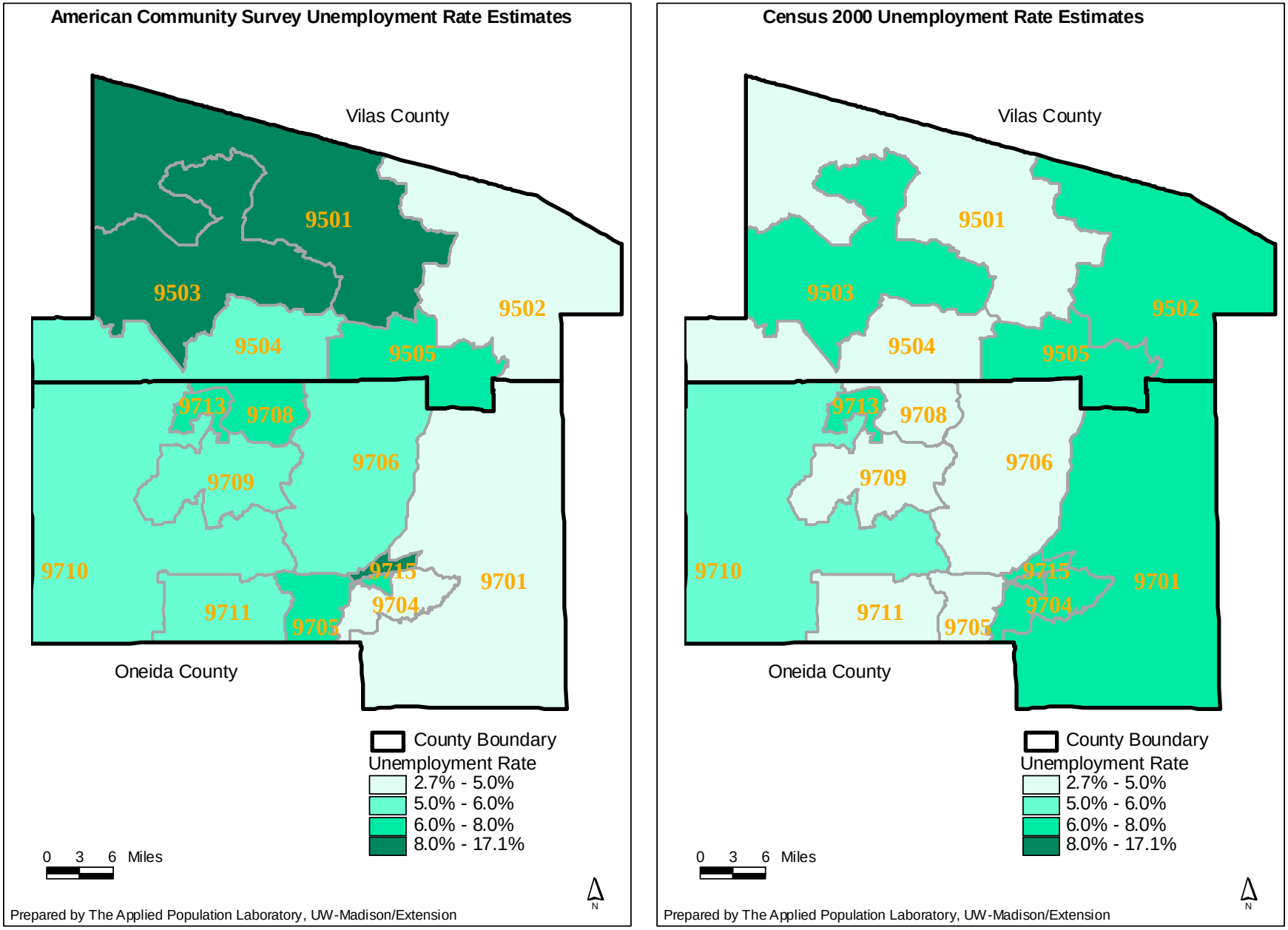


Figure 9

Wisconsin Counties Occupied Housing Units

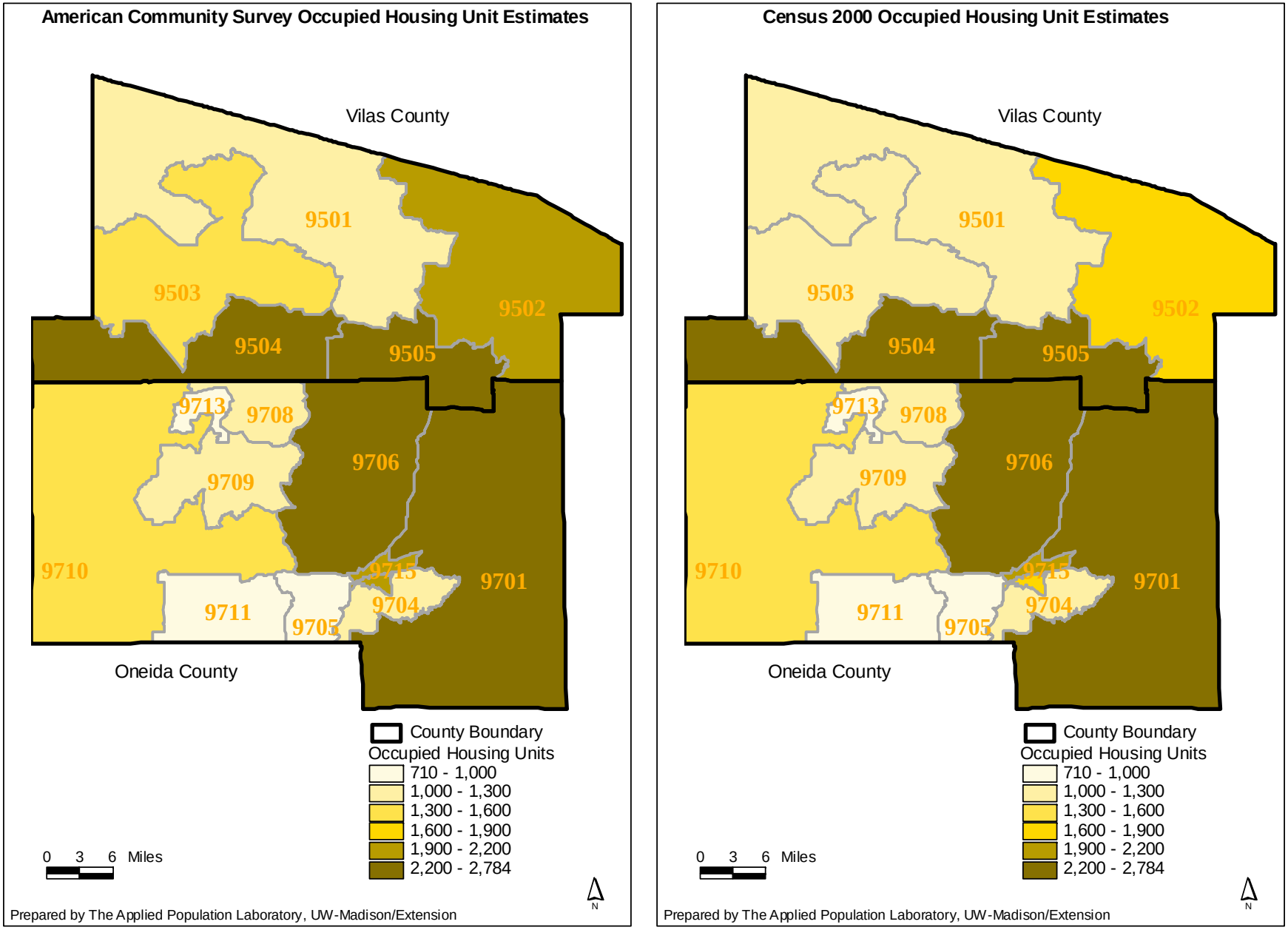
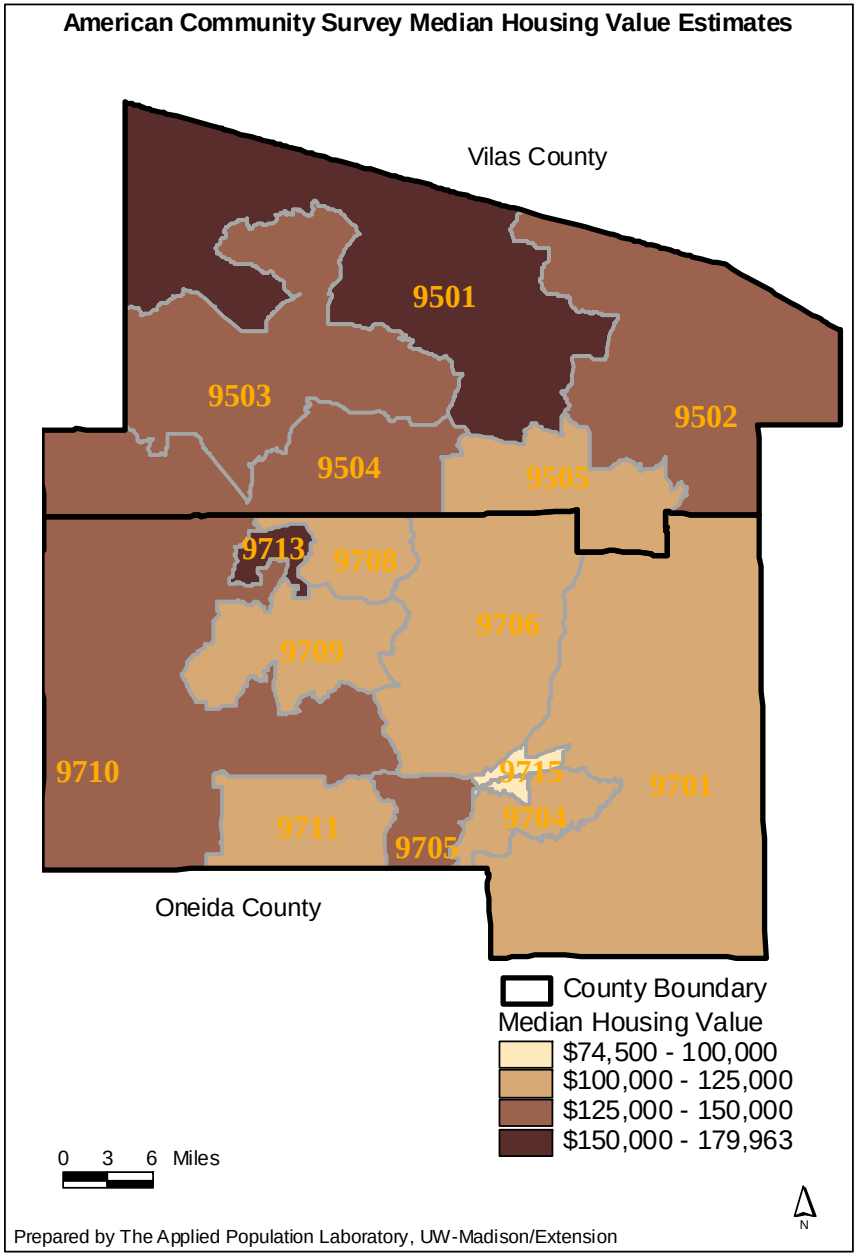
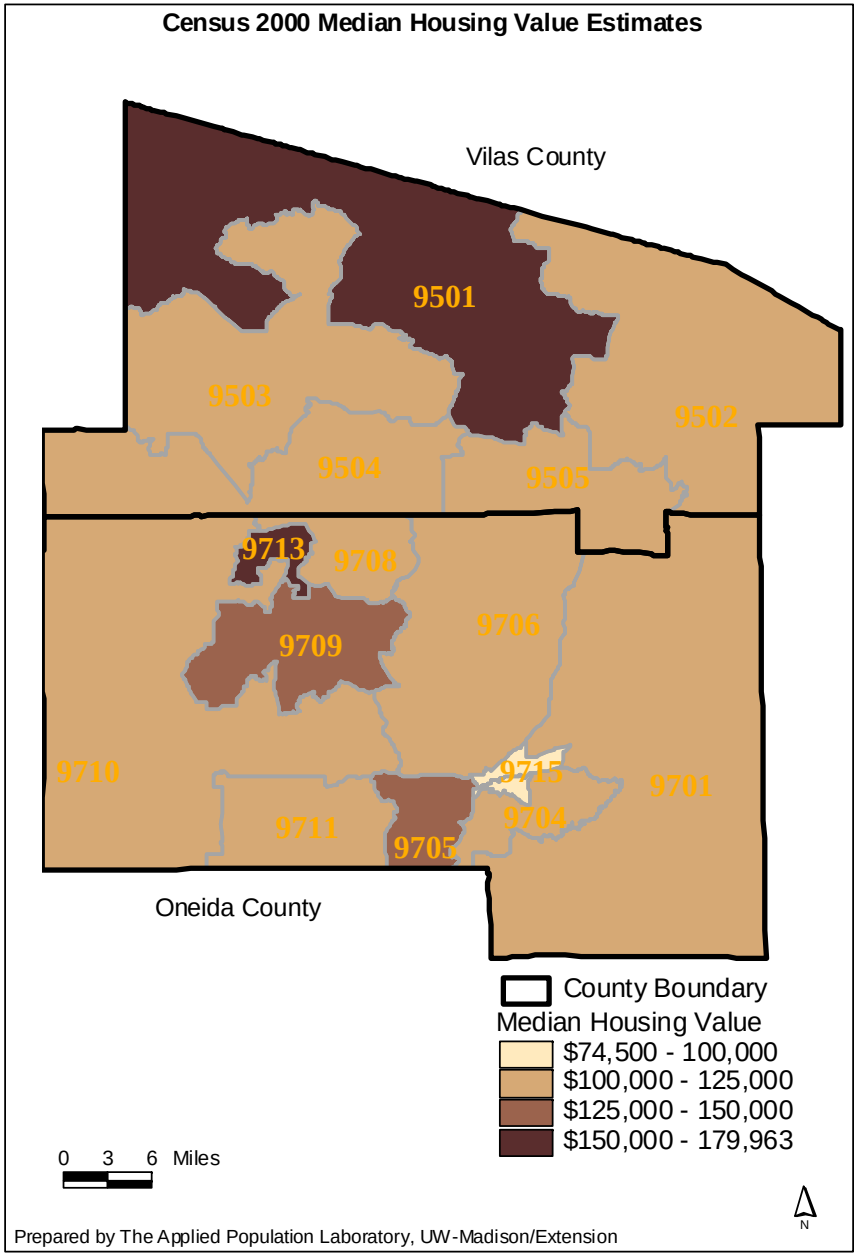


Figure 10

Wisconsin Counties Housing Value





E. Flathead County

The ACS data for Flathead County did not appear to demonstrate seasonality of population or support of the primary hypothesis to a great extent. Flathead County had the least number of relevant attributes demonstrating a significant difference between the ASC and long form, and had the most cases in which the significant difference between the ACS and long form data for relevant attributes was not in the expected direction. For occupied housing units, for example, there was not a statistically significant difference in Flathead County overall, and this number was lower for the ACS data in several individual census tracts.

The fact that Flathead County is relatively more urban than the other three counties – featuring the largest city in the study (Kalispell) – and has the lowest percentage of seasonal housing is the likely reason that the ACS data show fewer differences, consistent with our hypotheses. The ACS sample rate in Flathead County was closer to that achieved for the 2000 long form than in Vilas and Oneida Counties, and they may also be a contributing factor to our analysis revealing fewer significant differences. Tract 13, which includes a substantial portion of Flathead Lake, had two significant differences at the 99 percent confidence level – both in the anticipated direction – supporting our hypotheses.

The significant differences related to our hypotheses in Flathead County census tracts are presented in Table 9.

Table 9 – Flathead County Meaningful Differences

Indicator	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Seasonal Housing (%)	39.2	5.5	28.7	3.3	17.7	4.1	0.4	1.8	0.6	0.5	0.5	0.9	17.8	16.8
Pop 62+ (H)														
Med Age (H)						H***					L***			
HH65 (H)														
Avg HH Size (L)														
Occ HU (H)		L**	L*		L***			L*			H*		H***	
Own-Occ HU (H)		L*			L**						L*			L**
% Bach Deg (U)														L***
Unemp Rate (L)									L*		H*			
Not In Lab For (H)										H*		L*		
Med HH Inc (U)	L***									L*				
With Ret Inc (H)				H***		H**								L*
Med Hsng Val (H)						L*							H***	

F. Lake County

The ACS data for Lake County was relatively successful in demonstrating seasonality of population and support for the primary hypothesis. While there were relatively few attributes for which there was a significant difference between the ACS and long form data, Lake County had a fair number of such attributes in relation to the other counties in the study, and most differences were in the expected direction. This was the case even though Lake County's ACS sampling rate comes the closest to its 2000 long form sampling rate, which would seem to support our primary hypothesis. Lake County was the only county, for example, for which the household population 65 years and older was significantly higher in the ACS data.

A substantial portion of Tract 940300 is covered by Flathead Lake. This tract had three significant differences, two in the anticipated direction. In addition, Lake County had two census tracts in which the median value of housing was substantially higher in the ACS data, including in Tract 000100 – which includes Swan Lake and has 39 percent seasonal housing – where it was 96 percent higher in the ACS. As in the other counties in this study, there were other relevant attributes for which no difference was demonstrated or the difference was not in the expected direction, as was the case with occupied housing units in Lake County. An interesting result outside of the matrix attributes but supportive of our hypothesis is that in Lake County overall, there was a statistically significant difference in mean travel time to work, which was 16 percent higher in the three-year ACS average than in the 2000 long form.

The significant differences in Lake County census tracts are presented in Table 10.

Table 10 – Lake County Meaningful Differences

Indicator	000100	000200	940100	940200	940300	940400	940500	940600	940700
Seasonal Housing	38.7%	38.1%	2.9%	59.5%	21.4%	1.6%	1.6%	2.1%	1.3%
Pop 62+ (H)		L**						H***	
Med Age (H)									
HH65 (H)									
Avg HH Size (L)									
Occ HU (H)					H**			L**	
Own-Occ HU (H)	L*								
% Bach Deg (U)									
Unemp Rate (L)				L*					
Not In Lab For (H)	L*				L*				
Med HH Inc (U)					H***				
With Ret Inc (H)		L**						H**	
Med Hsng Val (H)	H***					H**			

Differences between ACS and long form estimates for certain matrix or related attributes in Flathead and Lake Counties are illustrated in Figures 11-13. As with the Wisconsin counties, while not all are statistically significant, there are a substantial number of differences between the ACS and long form, not all of which are in the hypothesized direction. One particularly interesting example is Tract 1 in Flathead County – with the highest percentage of seasonal housing in the county – for which there is disagreement for each of the attributes.

Figure 11

Montana Counties Householders Age 65 and Over

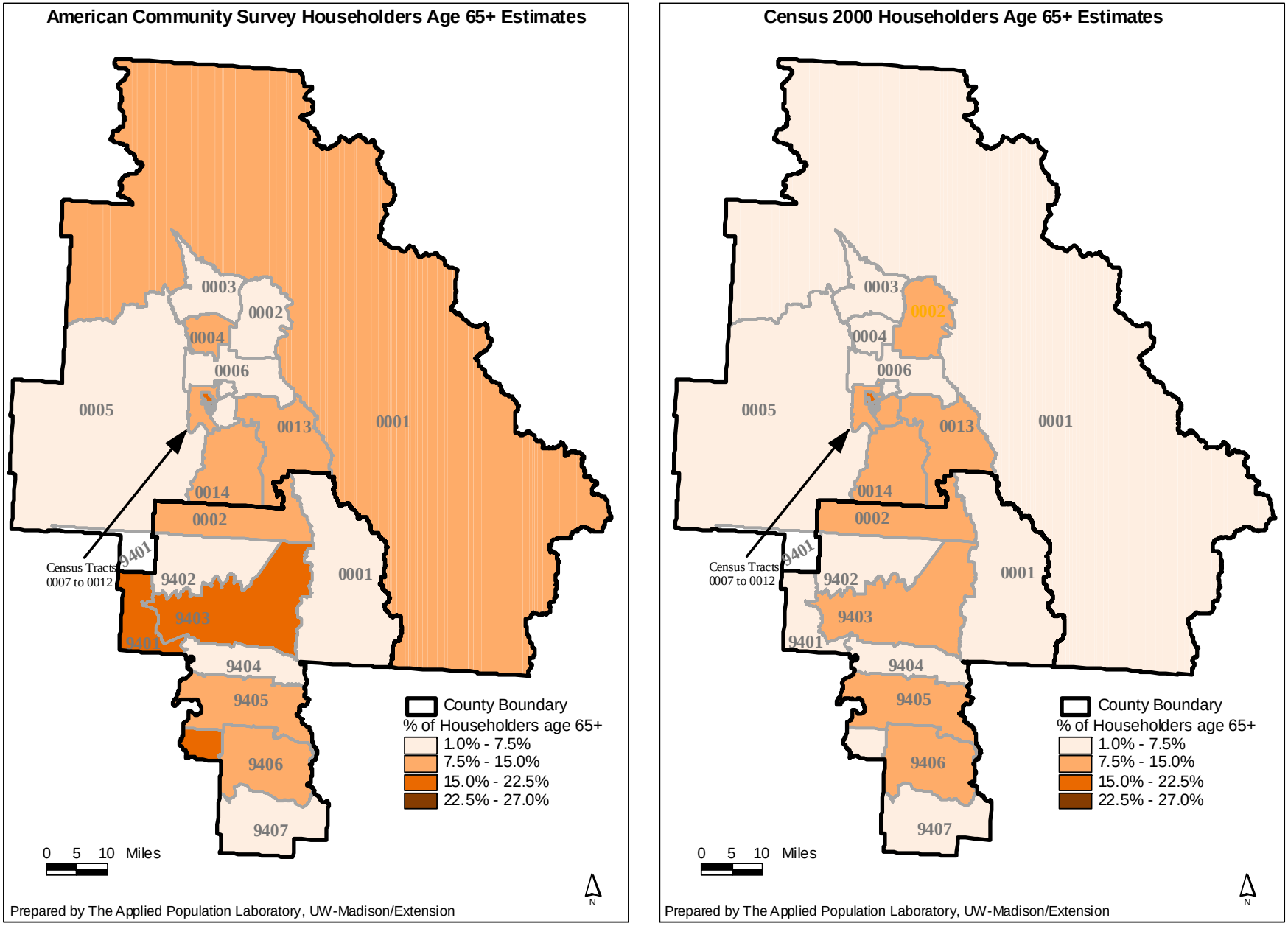


Figure 12

Montana Counties Median Household Income

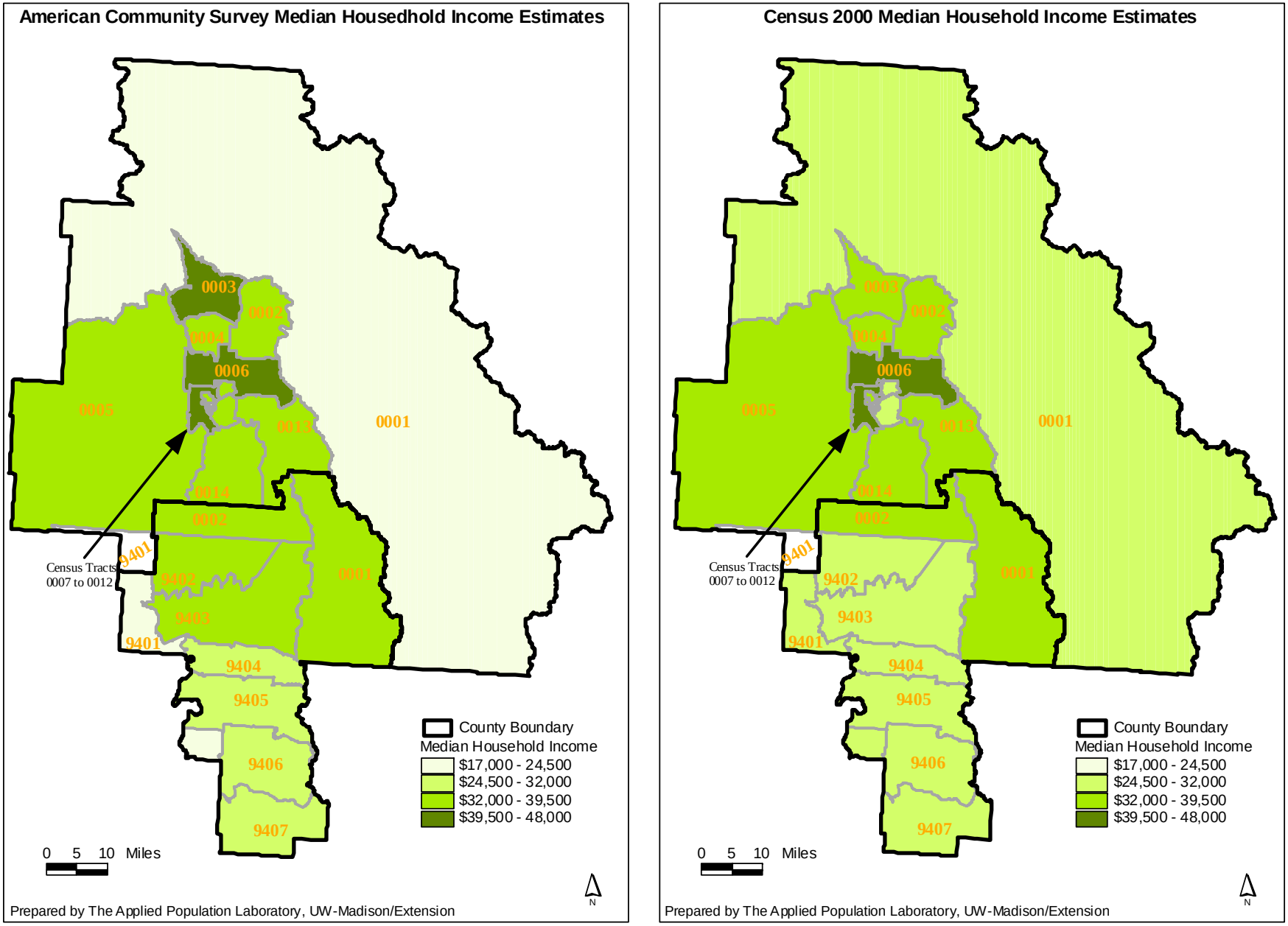
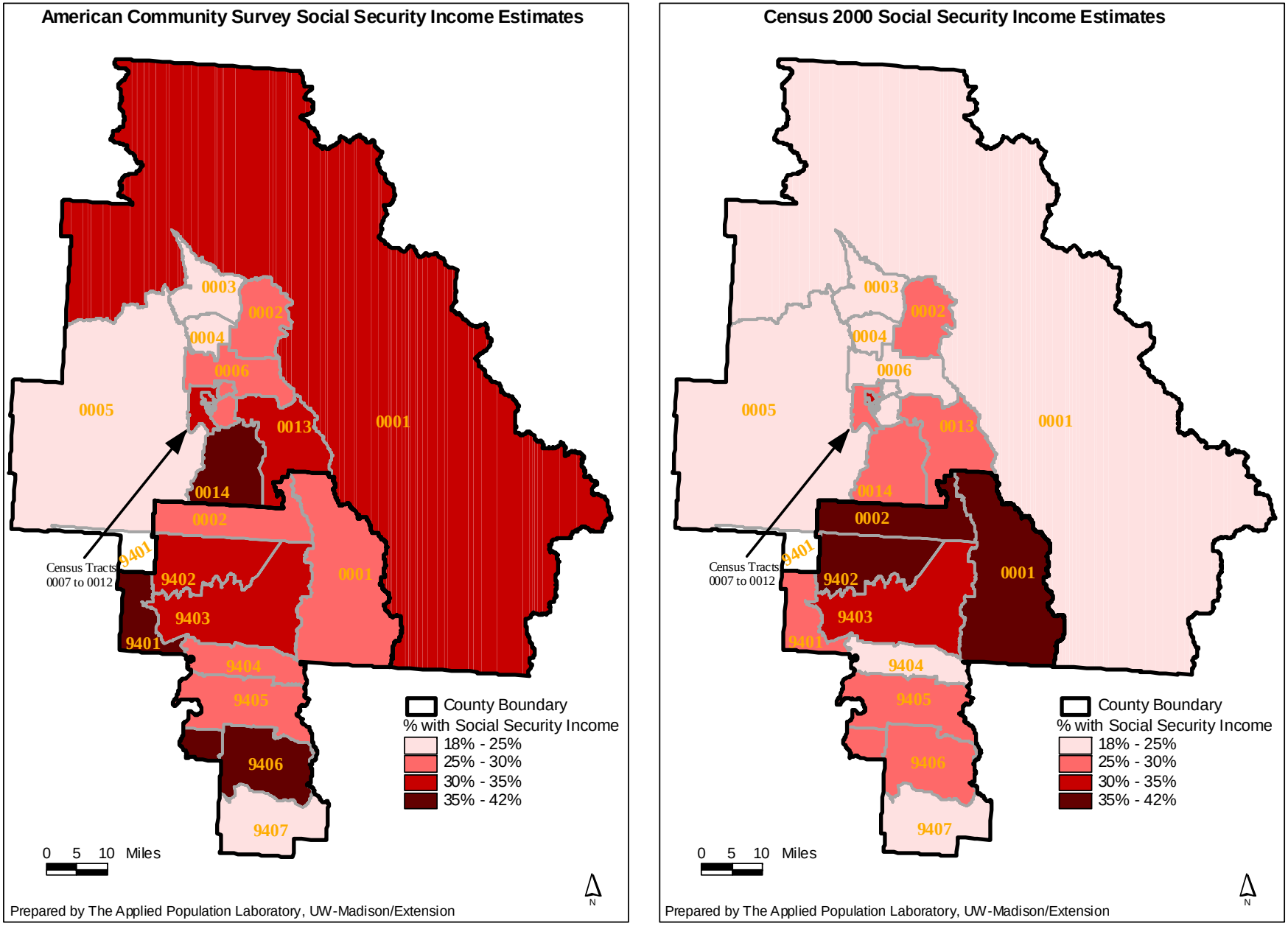


Figure 13

Montana Counties Social Security Income



G. Single-Year Data

Our purpose with this report is not to extensively examine the usefulness of single-year data, but this brief analysis is instructive. We compared the long form and ACS three-year averages in each county one for basic income attribute, per capita income. The results are summarized in Figure 14, which presents the point estimate and 90 percent confidence interval for these estimates. It should be noted that within the current parameters of the ACS, comparison is valid only in Flathead County, as it falls into the population range that should be able to utilize annual county ACS estimates.

Figure 14

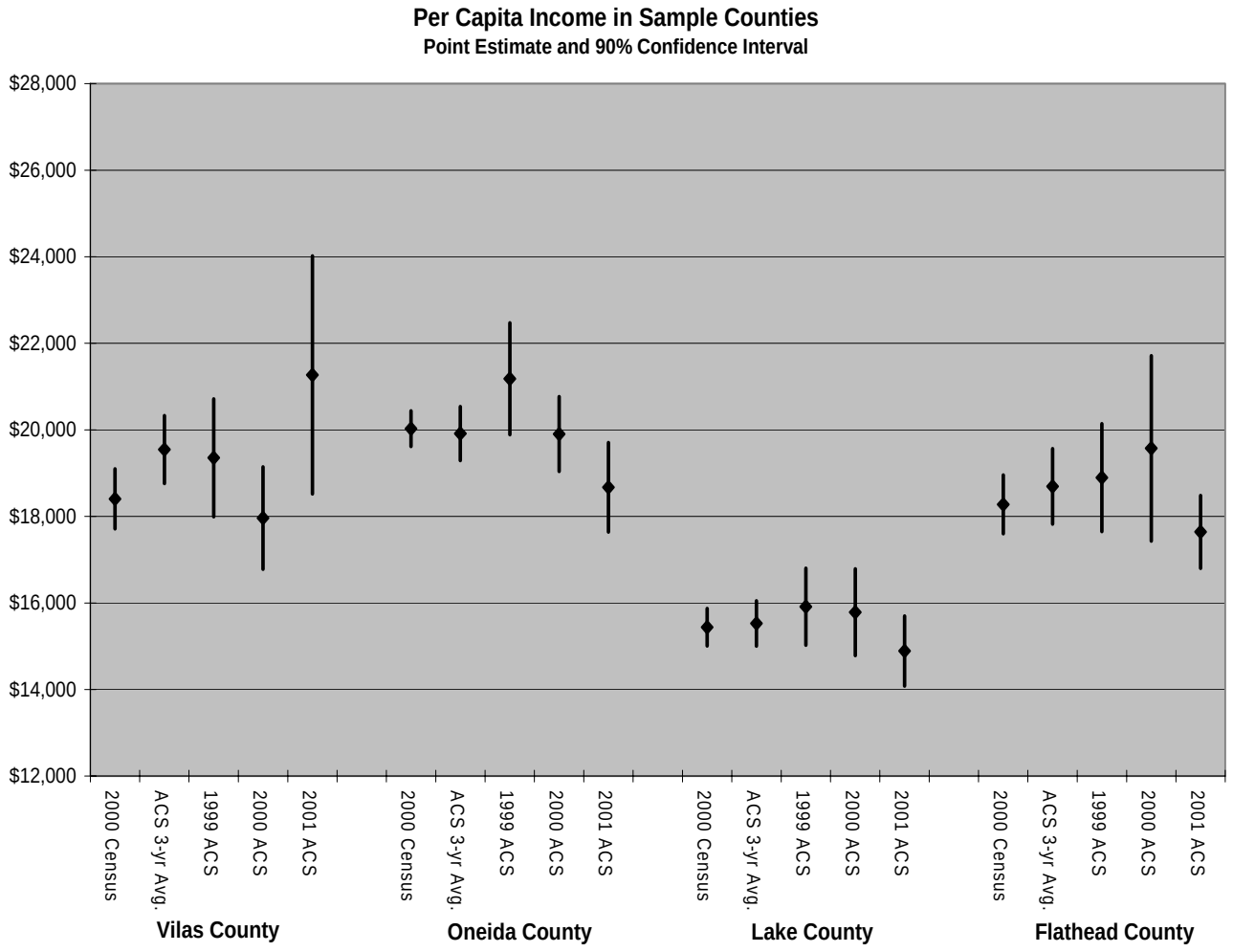


Figure 14 demonstrates that while for this particular attribute the estimates in our sample counties were fairly consistent overall, there were outliers, including the 2000 ACS estimate for Flathead County. It also underscores the inability of the ACS to provide reliable annual estimates for smaller areas like Vilas and Oneida Counties, particularly if they are not oversampled.

III. Analysis of Data Quality Measures

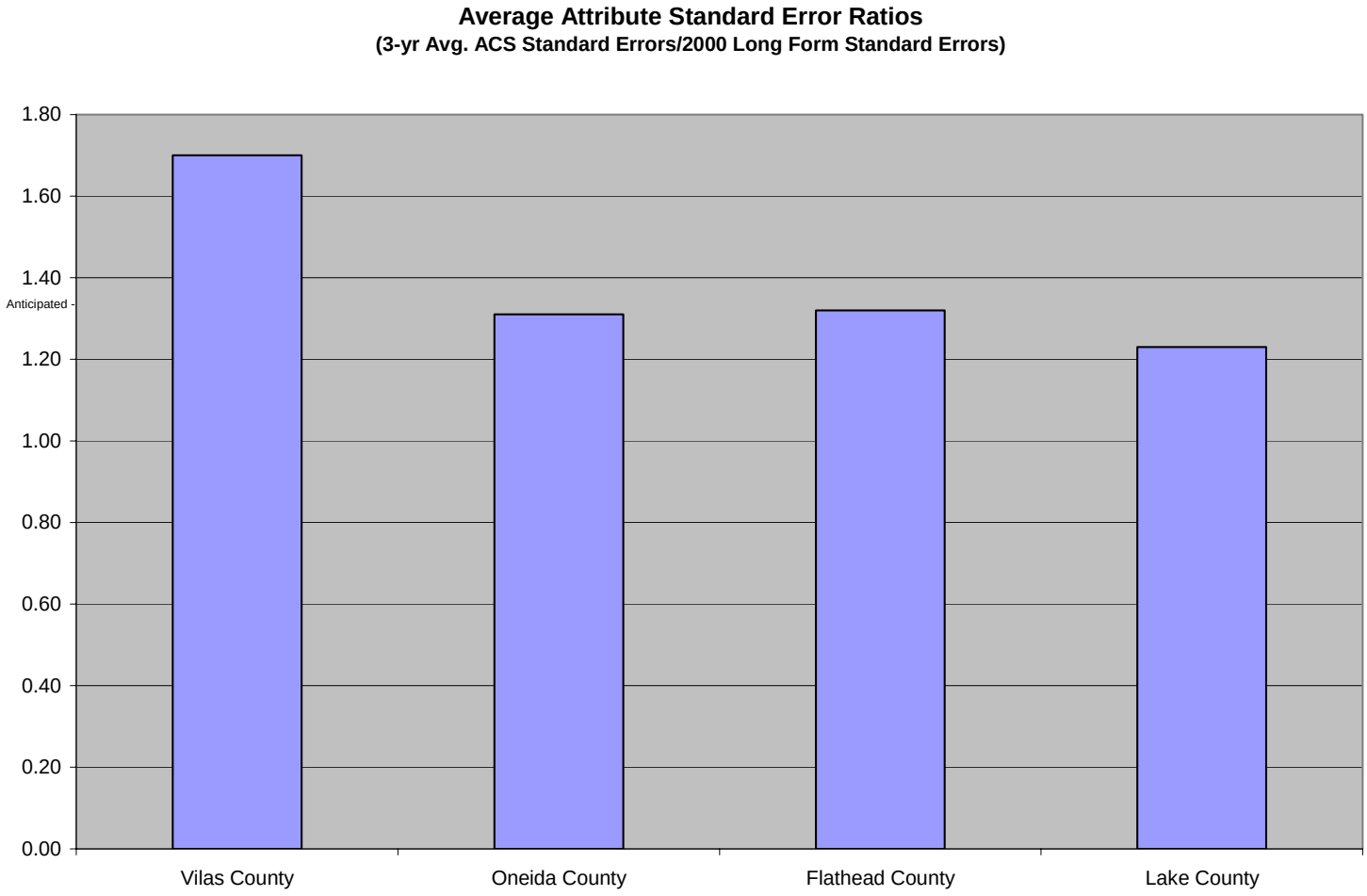
A. Standard Errors

An important consideration in this discussion of whether the ACS is an adequate replacement for the long form is data quality as reflected in the ACS standard error compared to that of the census. The Census Bureau has predicted that standard errors for the ACS will be uniformly higher than the long form due to the sampling differences discussed previously. They estimate that standard errors for attributes in the ACS data would be roughly one-third higher than those of the long form, for a 1.33 ratio.

At the county level, we compared the attribute standard errors for the census 2000 long form and ACS three-year averages in each of our subject counties and found that in three of the four subject counties the ratios were roughly equivalent or slightly lower than that predicted by the Census Bureau.[14] Our understanding is that this favorable statistical performance of the ACS estimates partly derives from the fact that statistical controls were applied at the county level.

[14] Attributes for which the standard error in either the long form or ACS was not provided were not included in the estimated standard error ratio calculations.

Figure 15



1. Vilas County

At 1.7:1, Vilas County had the highest ratios of standard errors of any county in study. This was not surprising given the small ACS sample compared to the 2000 long form sample in Vilas County. Figure 16 shows the ratio of the ACS standard error to the long form standard error in Vilas County for all of the attributes measured.

Figure 16

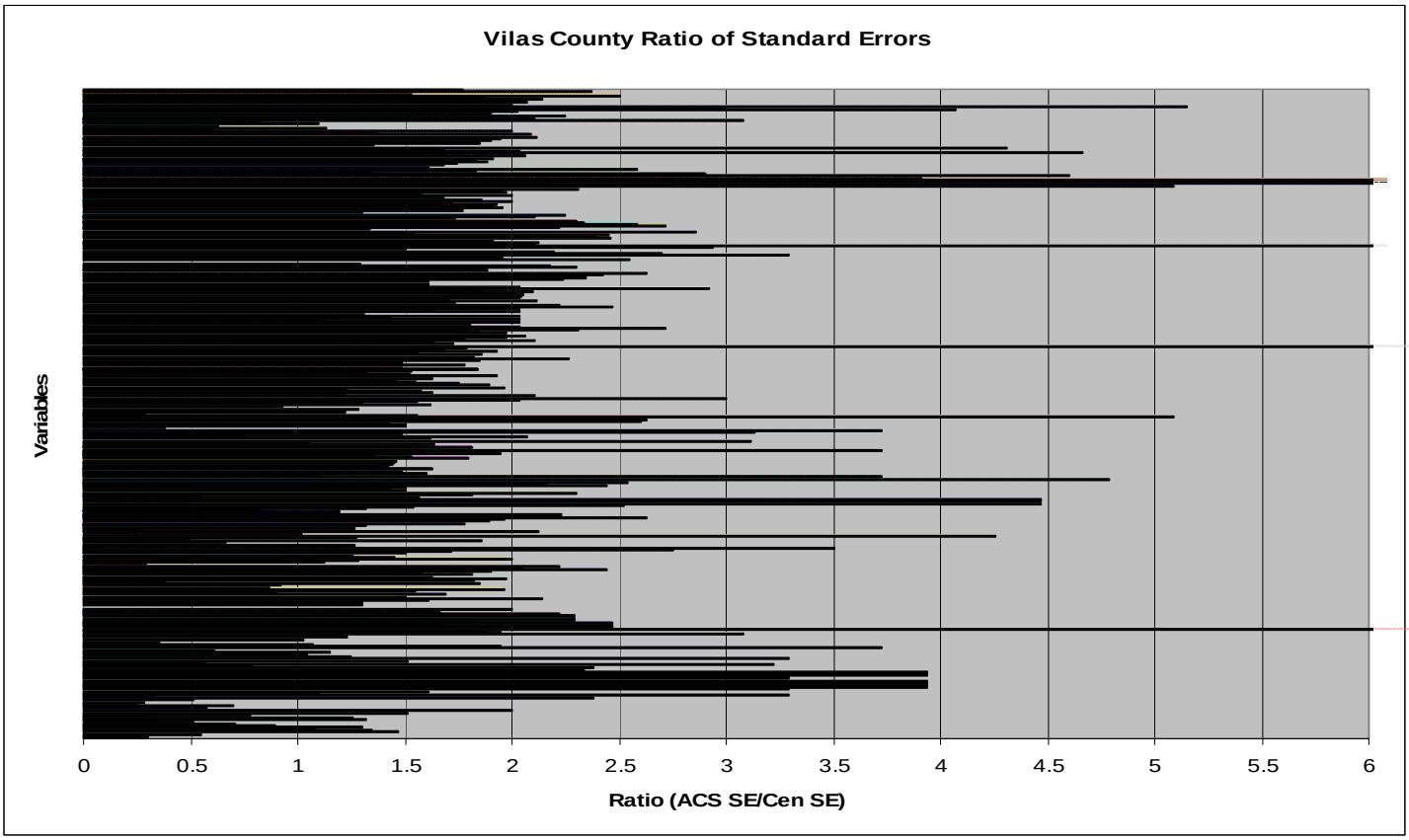
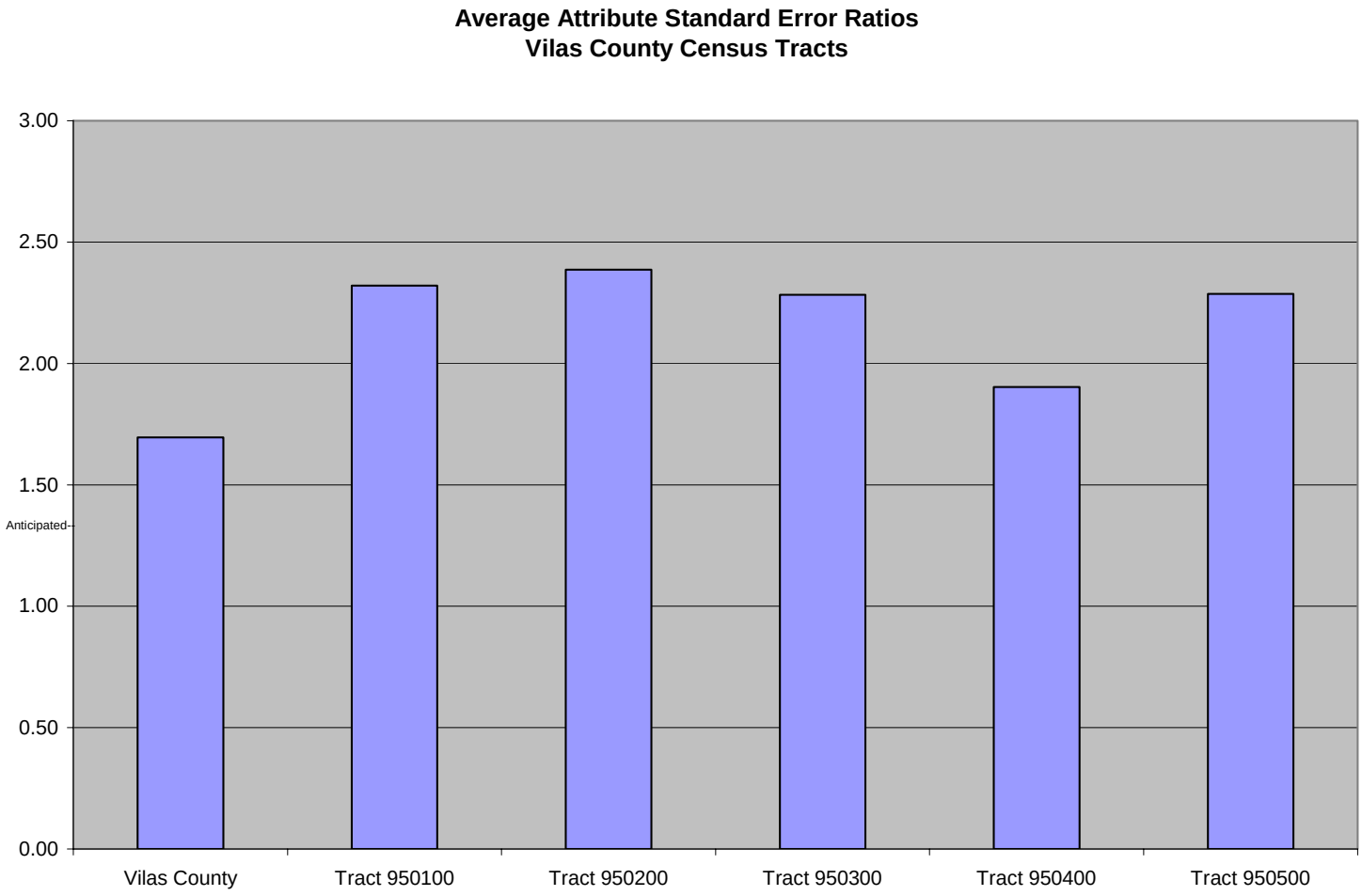


Figure 16 demonstrates the degree of fluctuation of standard error ratios amongst the ACS attributes in Vilas County. The standard errors in Vilas County are particularly apparent at the tract level, as presented in Figure 17. Again, this impacts the interpretation of the relatively large number of differences between ACS and long form data in Vilas County.

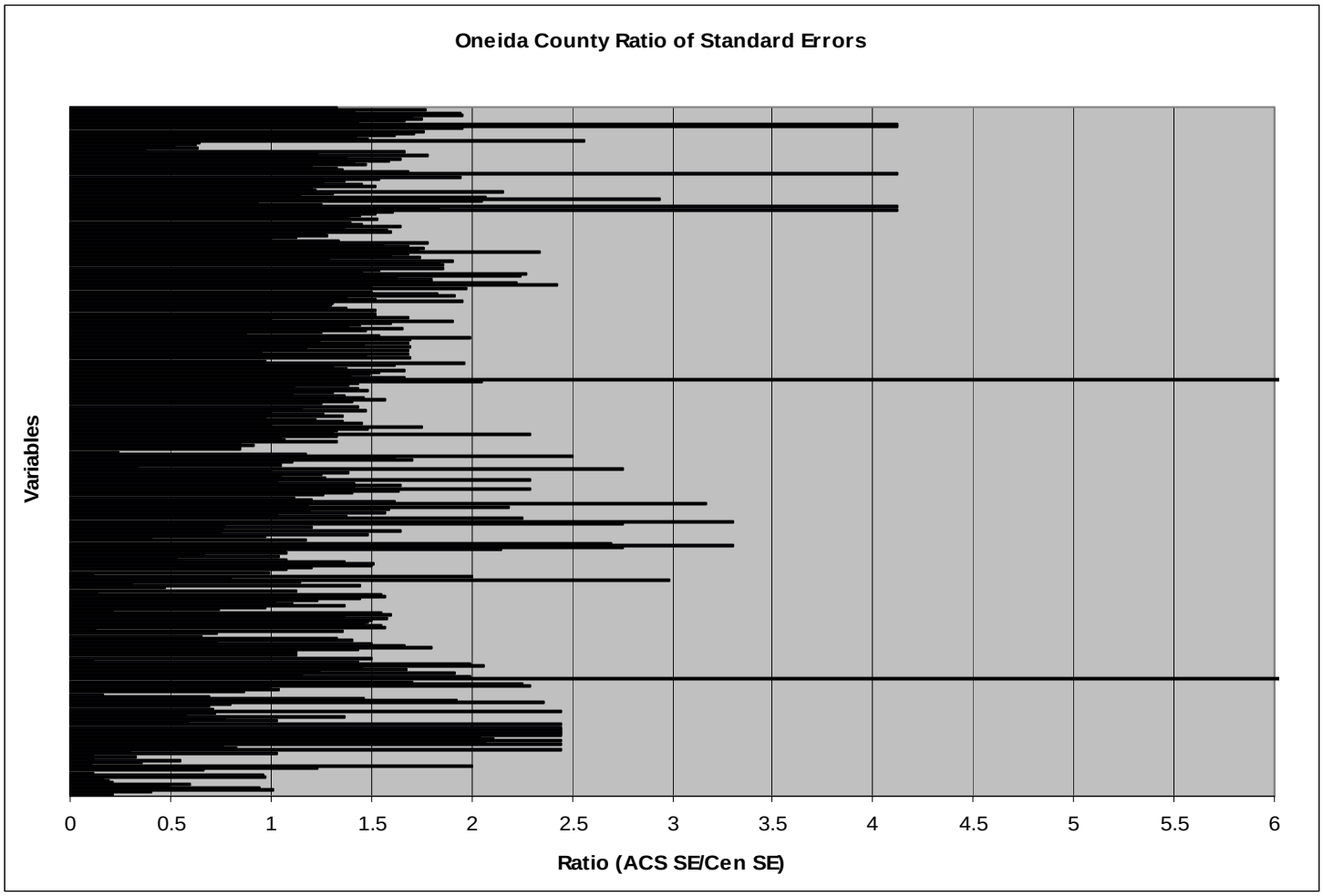
Figure 17



2. Oneida County

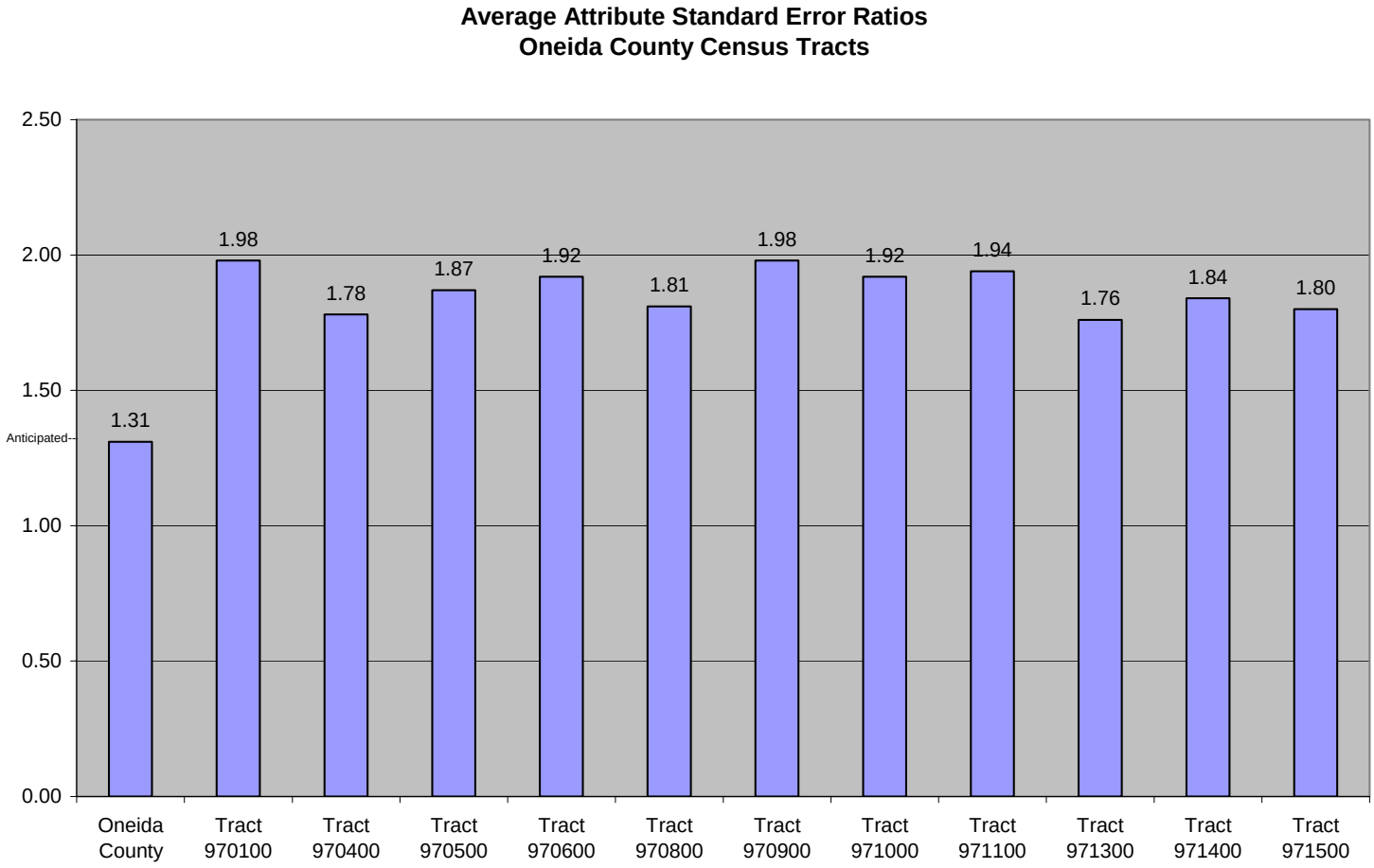
Figure 18 shows the ratio of the ACS standard error to the long form standard error in Oneida County for all of the attributes measured. While the standard error ratio exceeded the level predicted by the Census Bureau for many attributes in Oneida County, the overall ratio was 1.31.

Figure 18



The average attribute standard errors in Oneida County census tracts (Figure 19) exceeded the expected 1.33 ratio quite substantially.

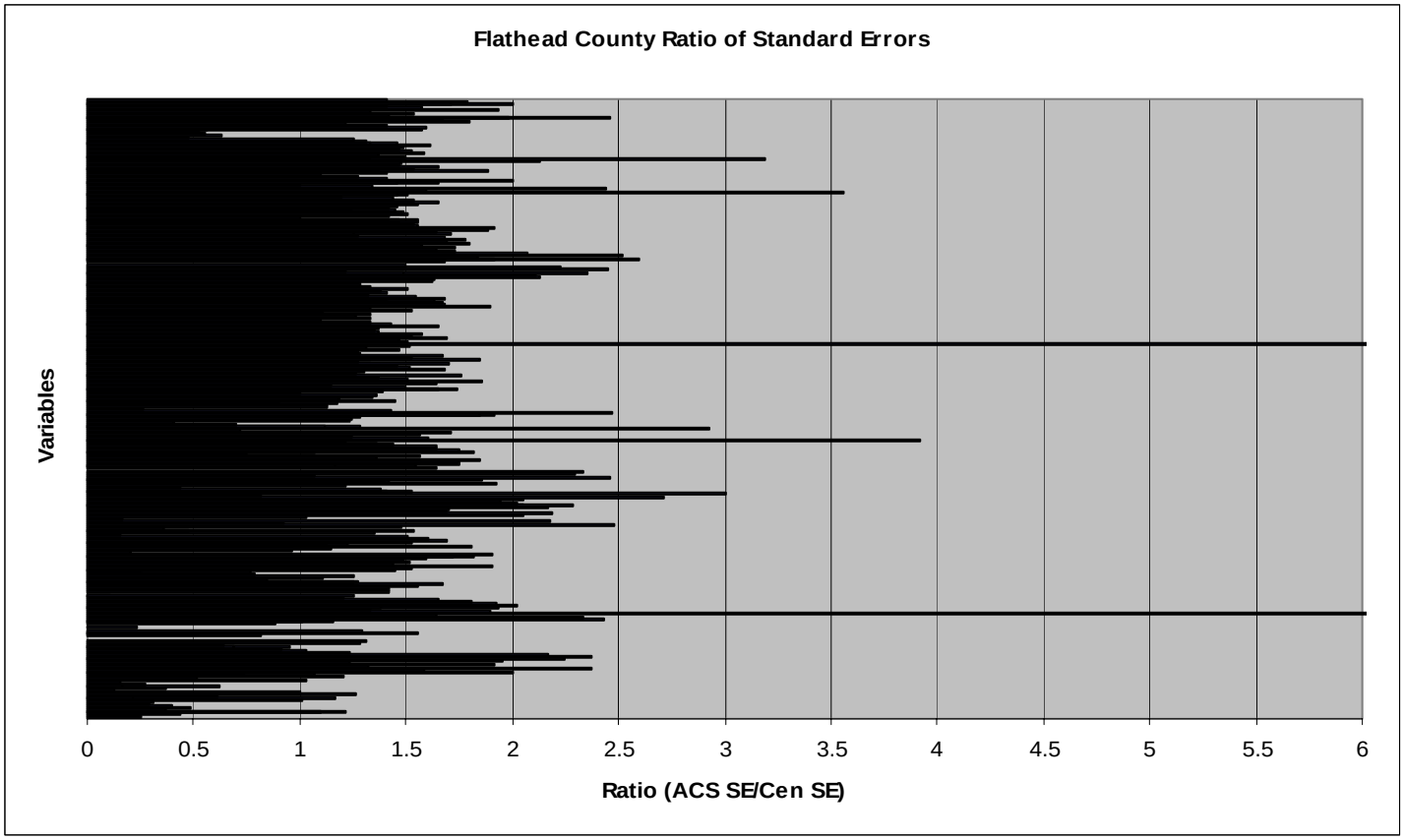
Figure 20


Average Attribute Standard Error Ratios
Oneida County Census Tracts
2.50
2.00
1.50
1.00
0.50
0.00
Anticipated
1.31
1.98
1.78
1.87
1.92
1.81
1.98
1.92
1.94
1.76
1.84
1.80
Oneida County
Tract 970100
Tract 970400
Tract 970500
Tract 970600
Tract 970800
Tract 970900
Tract 971000
Tract 971100
Tract 971300
Tract 971400
Tract 971500

3. Flathead County

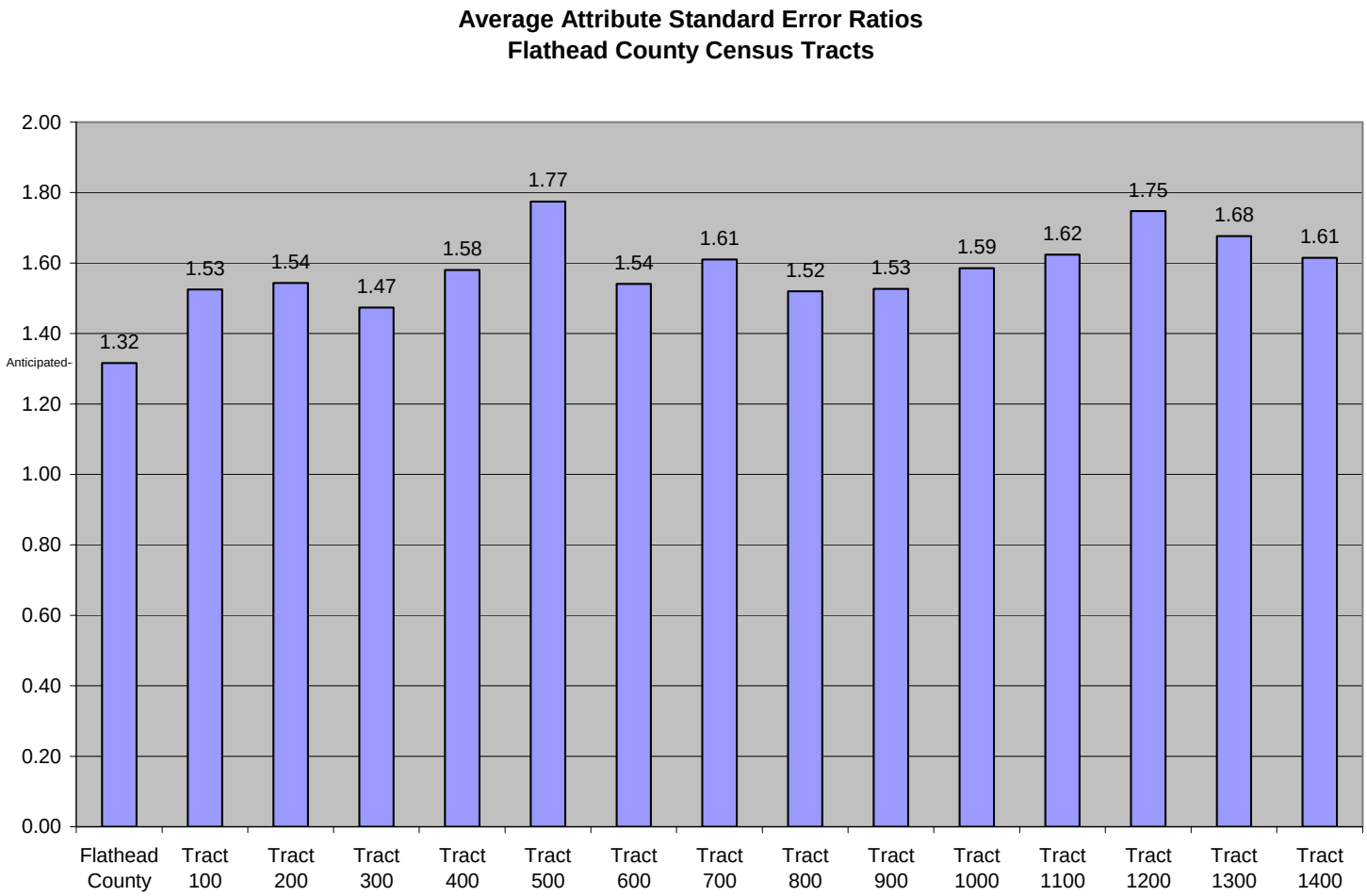
Flathead County (Figure 20) had a distribution of standard error ratios similar to that of Oneida County.

Figure 20



Average attribute standard errors exceeded the expected 1.33 ratio substantially in most Flathead County census tracts as well (Figure 21).

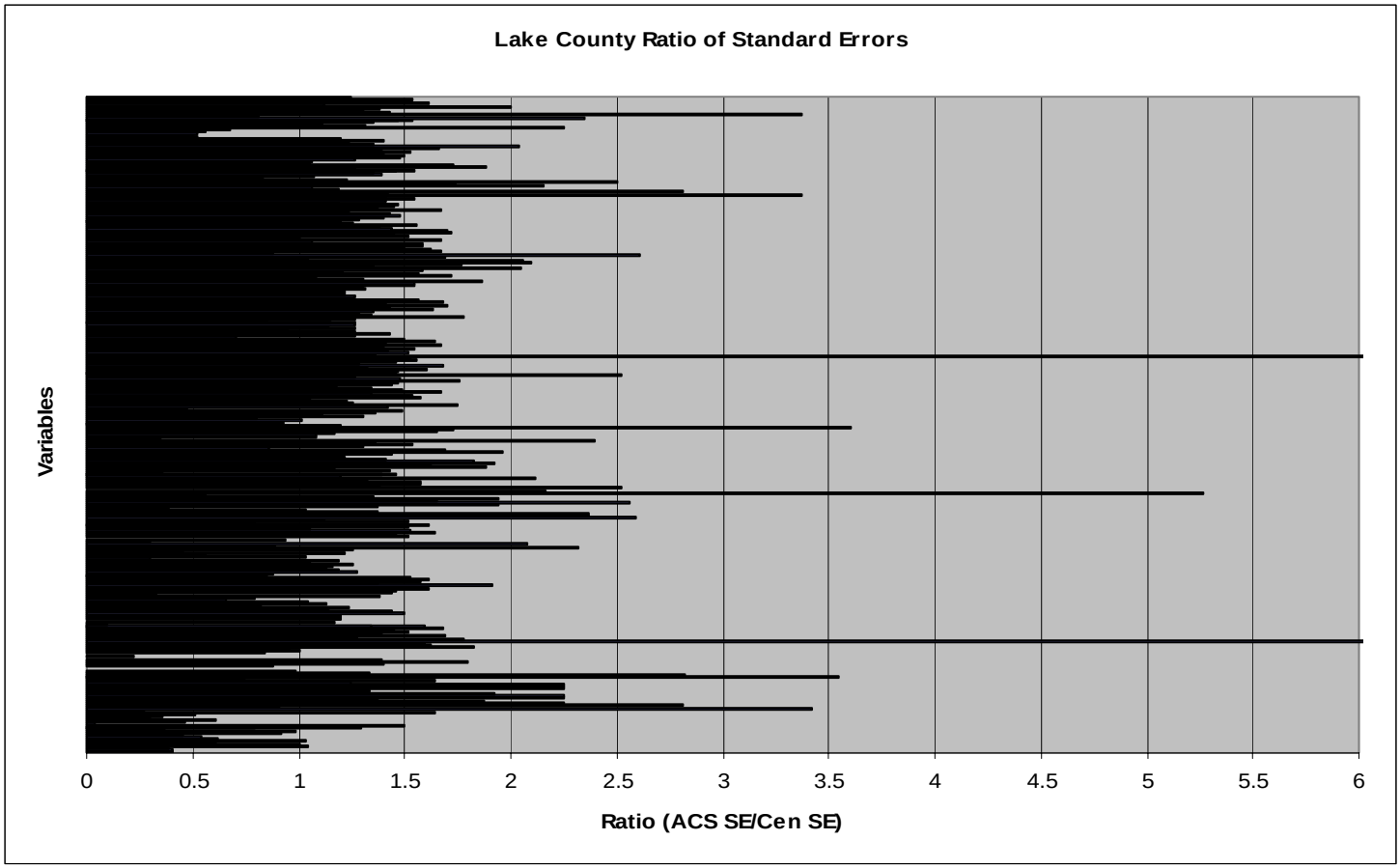
Figure 21


Average Attribute Standard Error Ratios
Flathead County Census Tracts
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Anticipated-
1.32
1.53
1.54
1.47
1.58
1.77
1.54
1.61
1.52
1.53
1.59
1.62
1.75
1.68
1.61
Flathead County
Tract 100
Tract 200
Tract 300
Tract 400
Tract 500
Tract 600
Tract 700
Tract 800
Tract 900
Tract 1000
Tract 1100
Tract 1200
Tract 1300
Tract 1400

4. Lake County

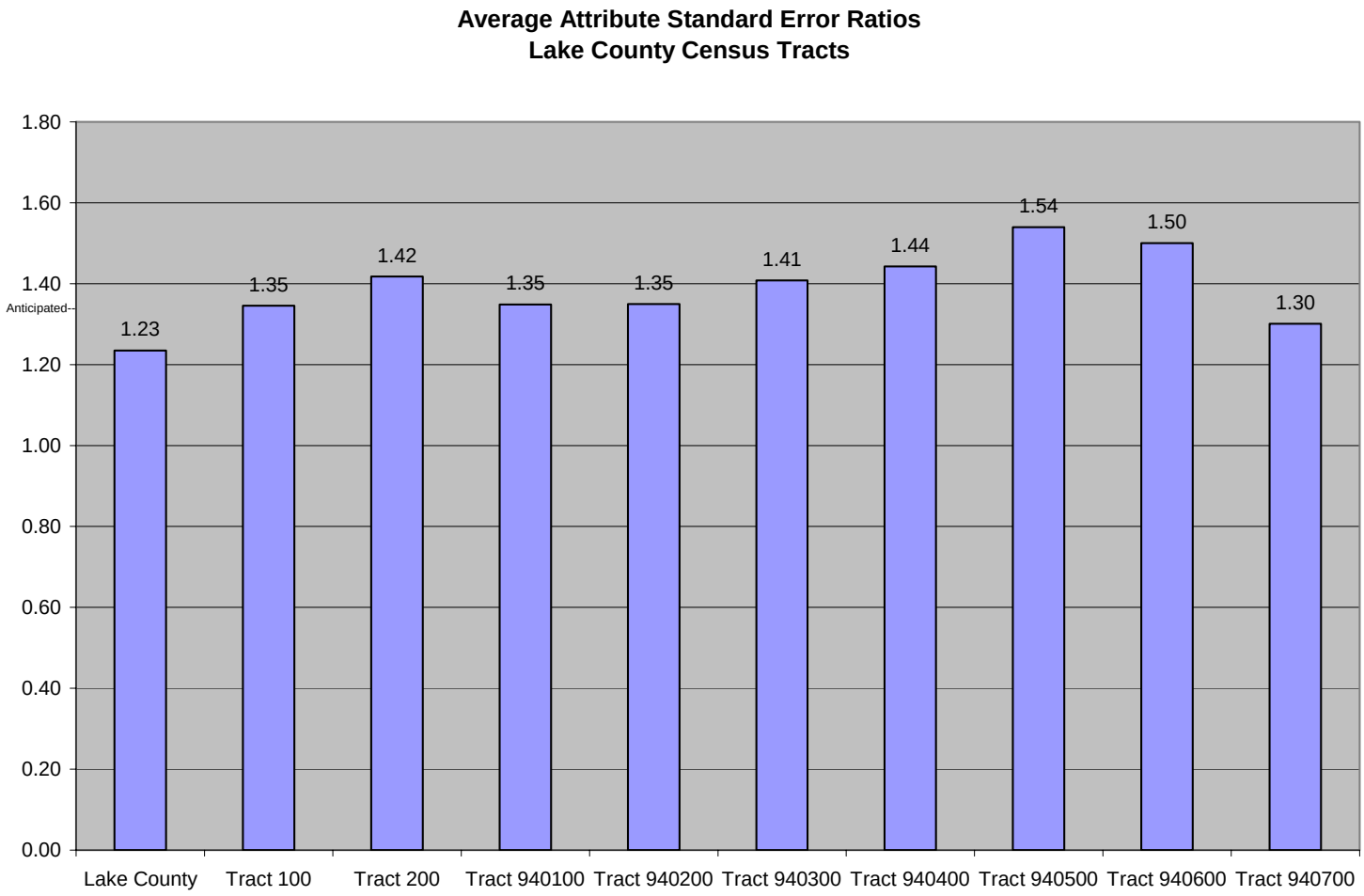
Despite its relatively small population, Lake County had the lowest overall standard error ratio, 1.23, of any county in the study (Figure 22). The ACS sample size more closely resembles the 2000 census sample in Lake County than in any of the other three counties, which might account for the lower standard error ratio.

Figure 22



Unlike each of the other counties in the study, Lake County maintained a relatively low standard error ratio even at the census-tract level (Figure 23).

Figure 23



B. Self-response Rate

While we do not believe that self-response rates can be adequately compared because of differences in enumeration methods in the ACS and 2000 long form samples, a brief discussion of the ACS and long form self-response rates follows.

Self-response refers to the direct response of individuals within the sample to the survey request. This quality measure generally refers to household data that came from a mail return, but is a measure unique to this Census 2000 long form and ACS three-year average comparison study. According to Susan Love of the Census Bureau, "The self-response rate provided for the Comparison Study was especially derived as a public cooperation measure that could be comparably calculated for both the ACS and the Census 2000 long form" (Love 2003, 2). This measure differs from the official mail return rate for both the Census 2000 long form and ACS. Love provides additional detail about this complex measure:

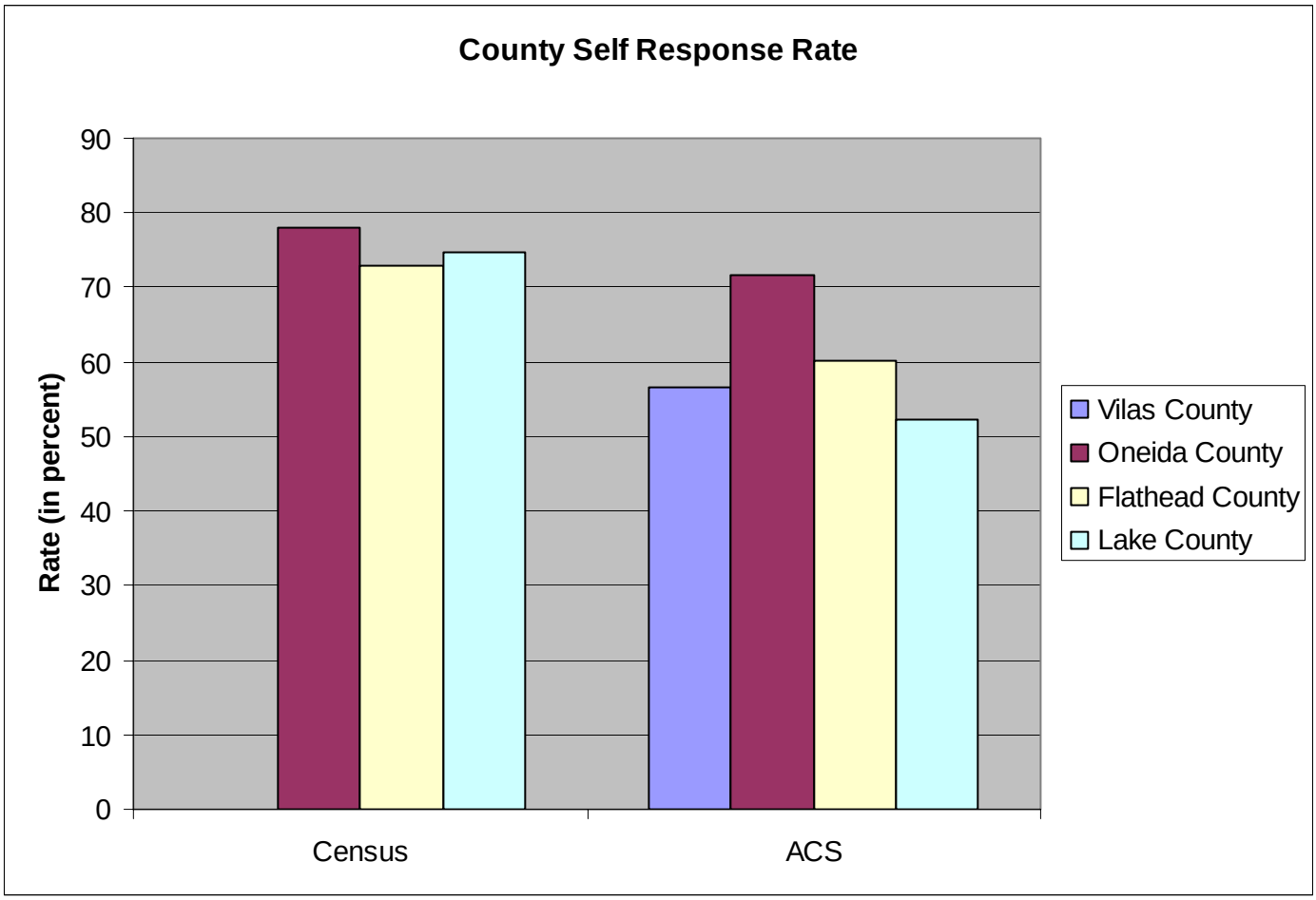
> The self-response rates provided for the Comparison Study have as their denominators occupied housing units initially weighted by the inverse of their sampling fractions. This weighting is done in recognition of the four differential sampling rates used in both Census 2000 and ACS. The census universe of occupied units consists only of

> those units enumerated on a long form housing unit questionnaire in mailback types of enumeration areas (mailout and update/leave), weighted by the inverse of each unit's sampling fraction (the rate applied to the block in which the unit is located). Long form units in areas that did not use mailback methods are not included in the denominators. The ACS universe of occupied units consists of all interview and noninterview sample units weighted by the inverse of their sampling fractions, including the CAPI subsampling fraction where applicable. The ACS uses only a mailout methodology, so all sampled units are included in the denominators.
>
> The numerators of the Census 2000 long form self-response rates consist only of occupied units for which a long form housing unit mail return questionnaire was received. There was no other way for people to self-respond as a long form unit. The numerators of the ACS self-response rates consist of occupied units for which an ACS mail return questionnaire was received or a Telephone Questionnaire Assistance interview taken. All units in the numerators are weighted by the inverse of their corresponding sampling fractions (Love 2003, 2).

For the 2000 long form, self-response was facilitated either through update/leave or mail out/mail back enumeration methods, neither of which was common in the four counties in this study (Bench 2003). Since long form units in areas that did not use mailback methods are not included in the denominators of the equations used to derive self-response rate, direct comparison of this rate is limited to the tracts in the study that used mailback methods.

The long form fared considerably better than the ACS in this measure as demonstrated in Figure 24. See Appendix B for detailed results of this measure.

Figure 24

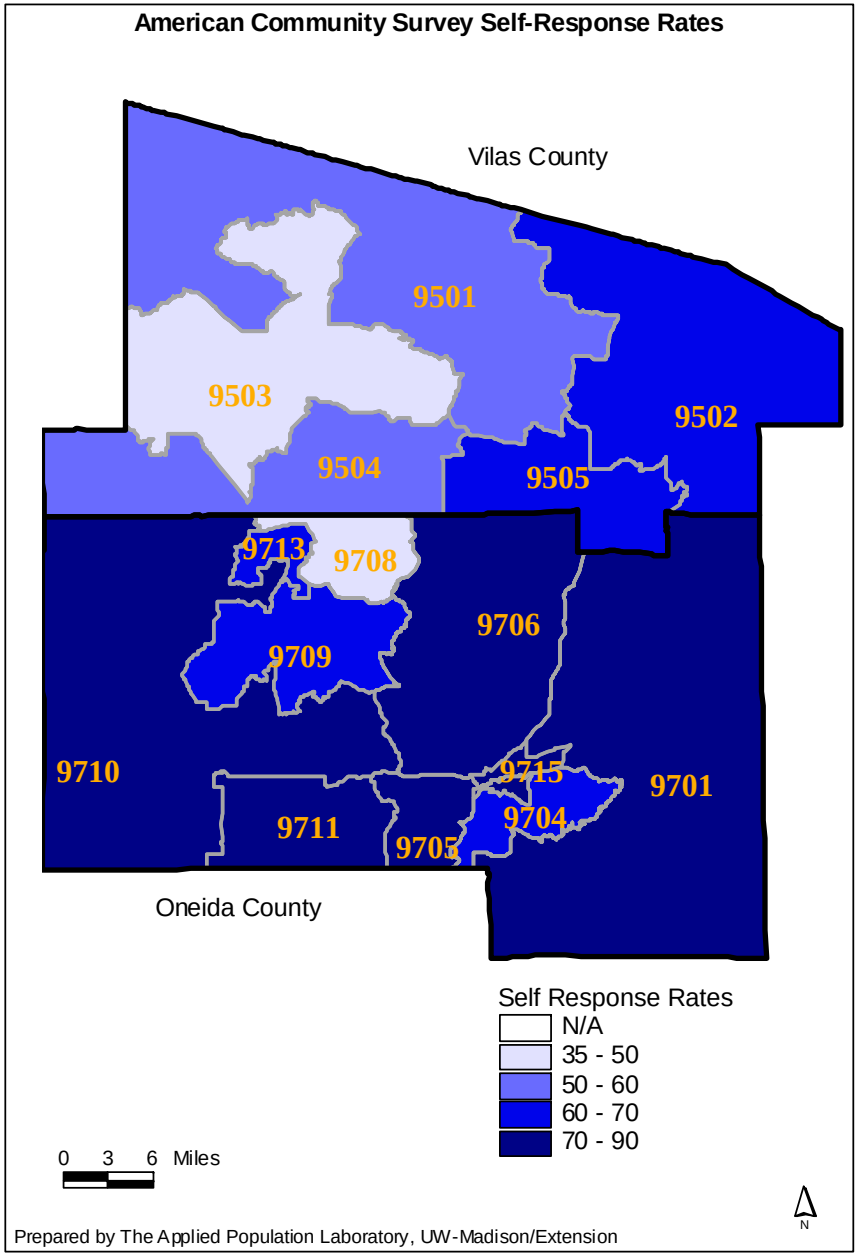


A self-response rate was not provided for the long form in Vilas County. It is our understanding that this is because the entire county was surveyed using either list or update/enumerate in 2000 (with no mailback methods used).

Self-response rates at the census tract level for each county are presented in Figure 25 and Figure 26.

Figure 25

Wisconsin Counties Self-response Rates



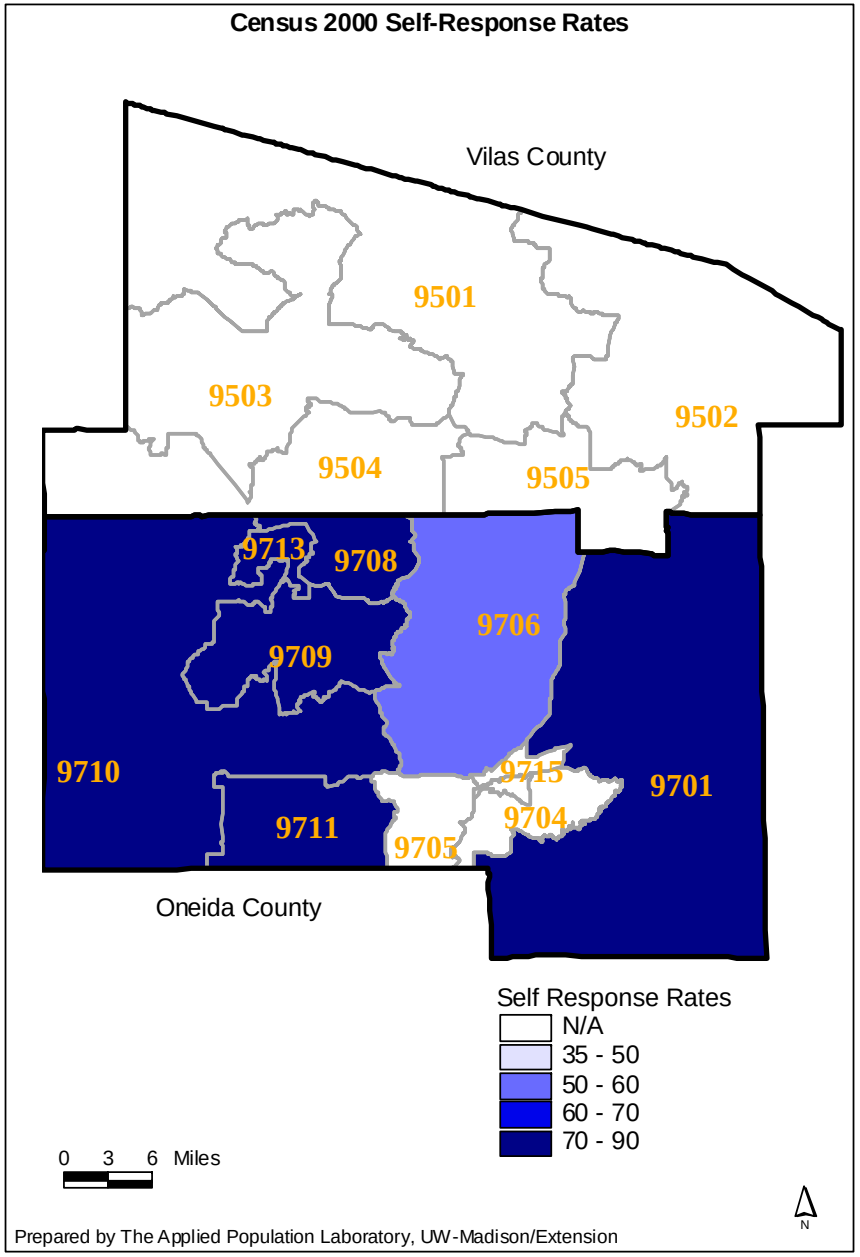
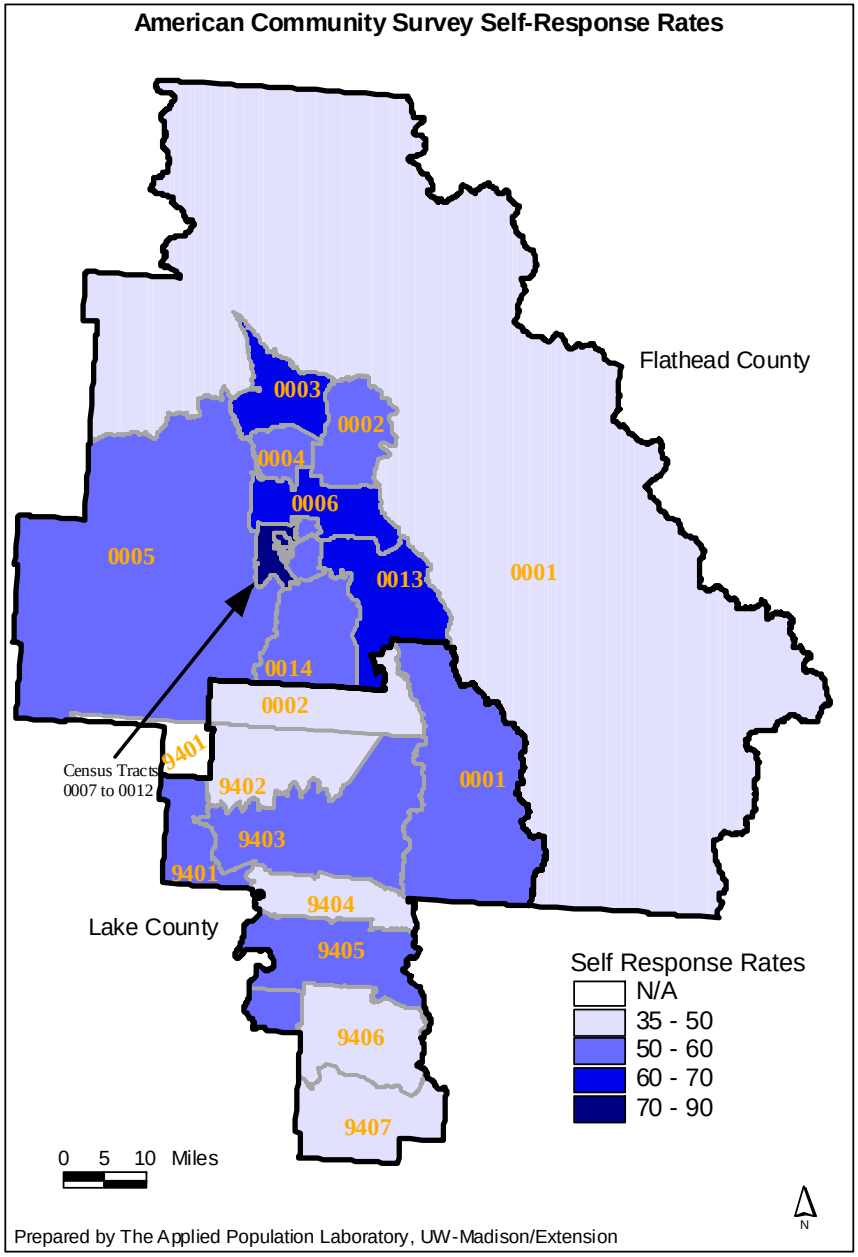
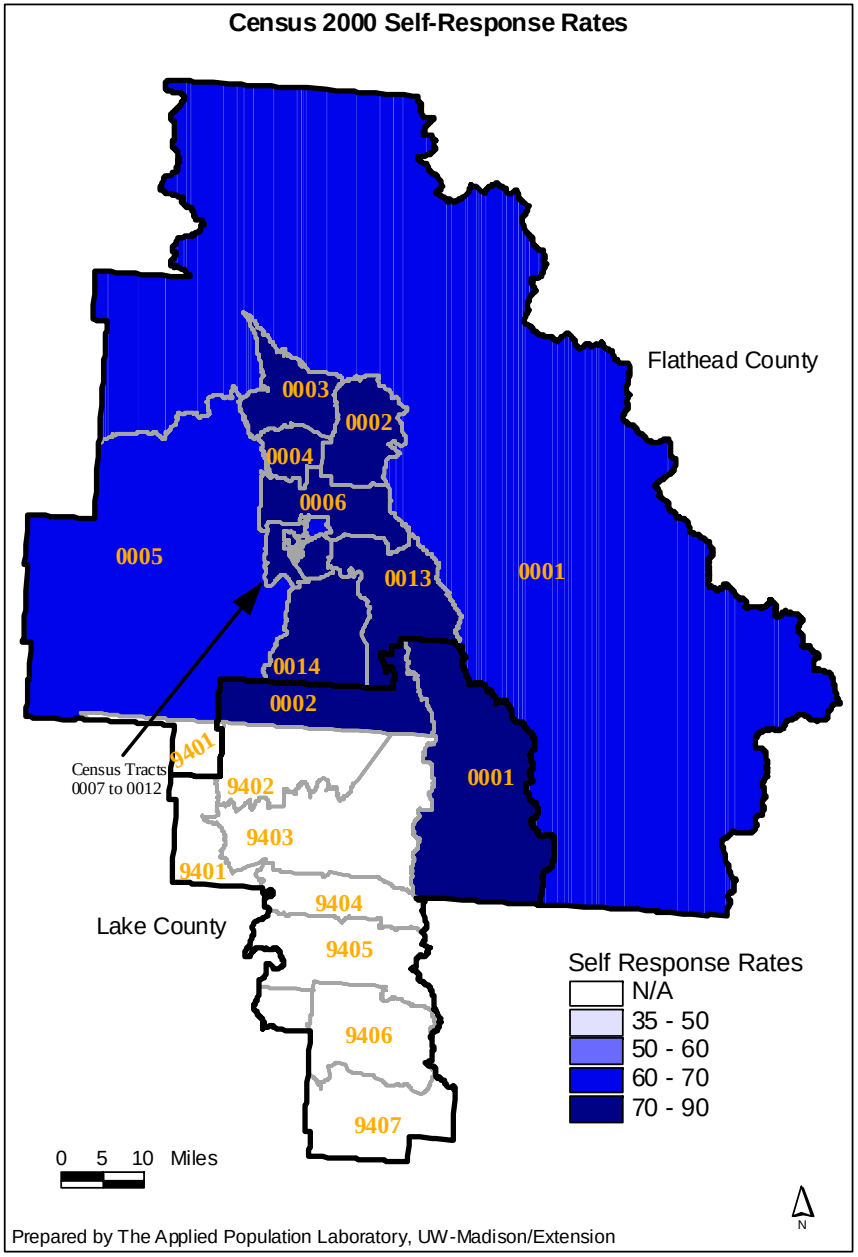


Figure 26

Montana Counties Self-response Rates





C. Non-response Rate

1. Unit Non-response Rate

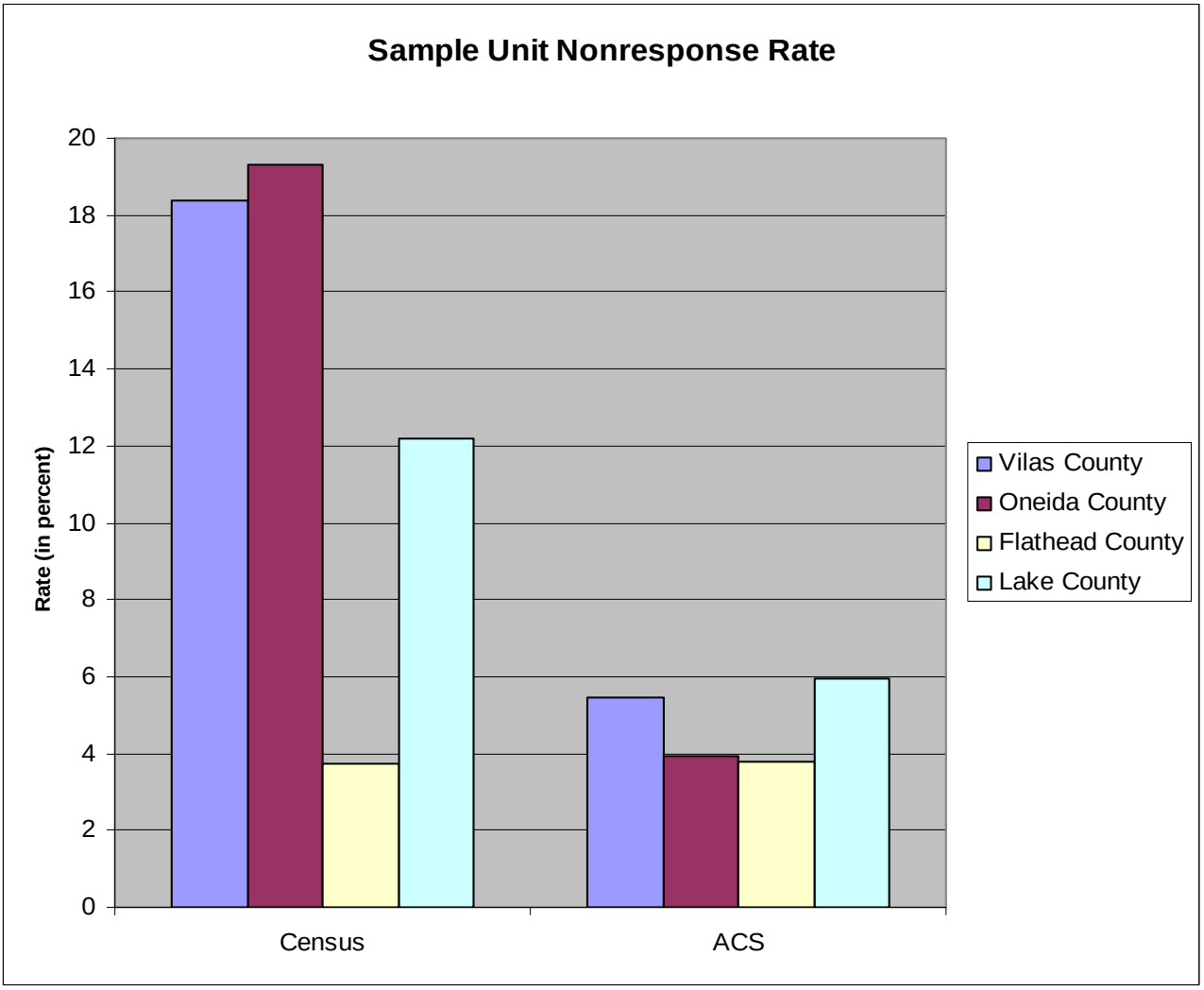
Non-response is the most prominent source of nonsampling error (U.S. Census Bureau 2003, 3). There are two types: unit non-response and item non-response. Unit non-response is the failure to obtain data from a unit in the sample and occurs because households are unwilling or unable to participate, or because an interviewer was unable to make contact with a respondent for a sample unit (U.S. Census Bureau 2003, 3). Item non-response rate refers to the percentage of individual survey questions not answered by respondents.

The sample unit non-response rates and occupied sample unit non-response rates were provided for each ACS county. The Census 2000 sample unit non-response rate is based on the comparison of the number of long form sample units weighted by their probability of selection and the 100% housing unit count (Bench 2003). See Bench (2003) for further explanation of the long form non-response formula.

There were substantial differences between the Wisconsin and Montana counties on this quality measure. In Wisconsin, the ACS fared notably better than the long form in both counties overall and for each census tract, both for sample unit non-response and occupied sample unit non-response. This suggests that there is potential for the ACS to substantially reduce non-response bias in its data compared with the long form sample.

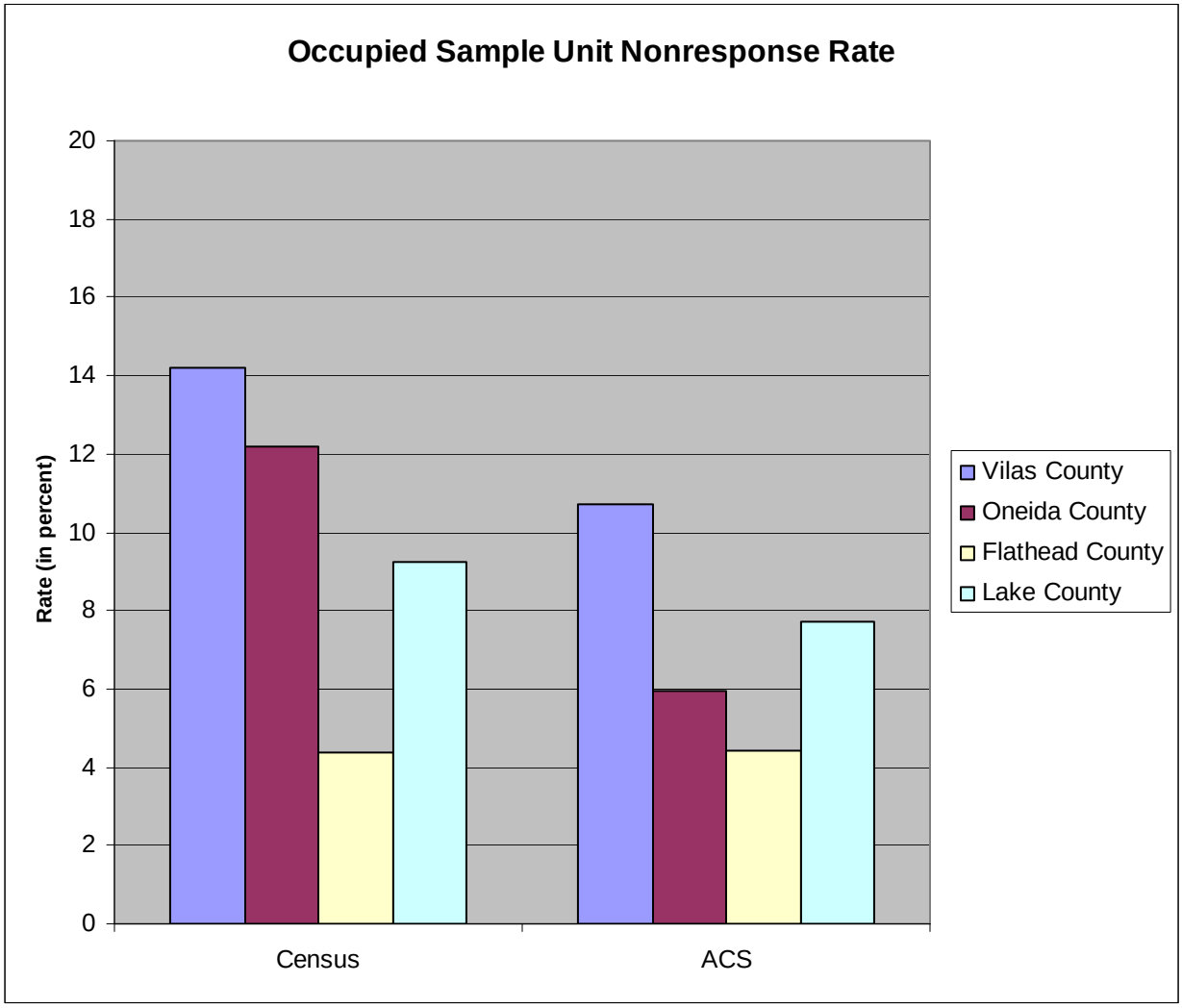
In Montana, on the other hand, while the ACS fared much better than the long form in Lake County, in Flathead County the non-response rates for the ACS and long form were generally the same, with the long form slightly outperforming the ACS. Sample unit non-response rates for the four counties are illustrated in Figure 27.

Figure 27



Occupied sample unit non-response rates for the four counties are illustrated in Figure 28.

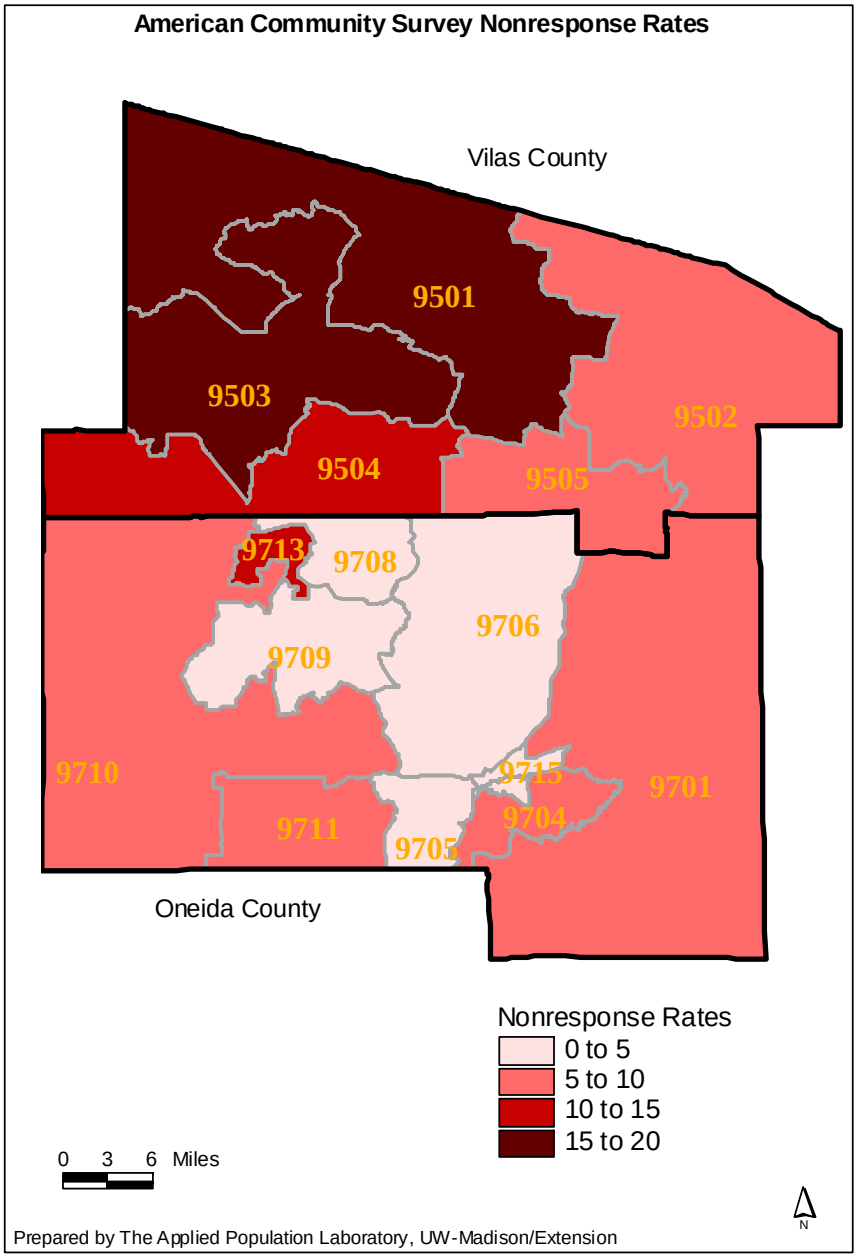
Figure 28



Non-response rates at the census tract level for all four counties are presented in Figure 29 and Figure 30.

Figure 29

Wisconsin Counties Nonresponse Rates



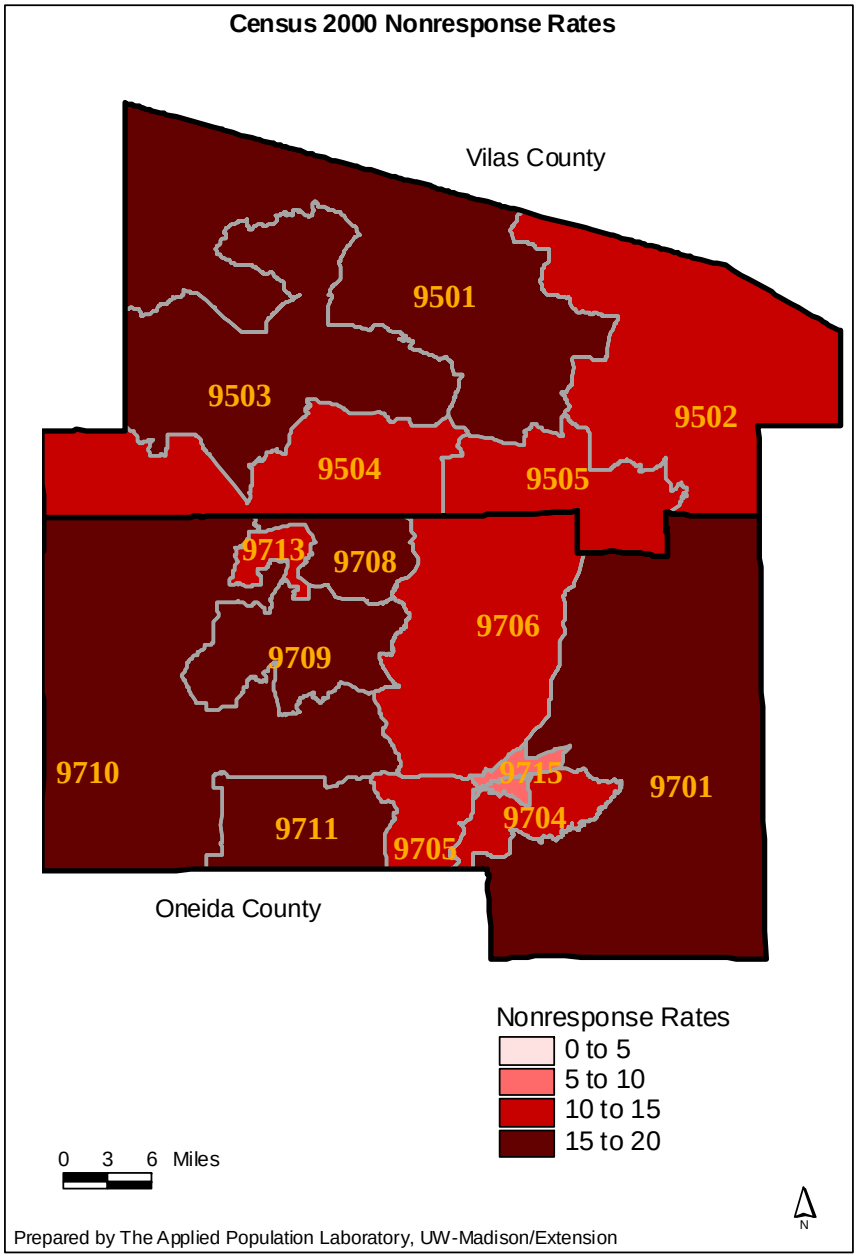
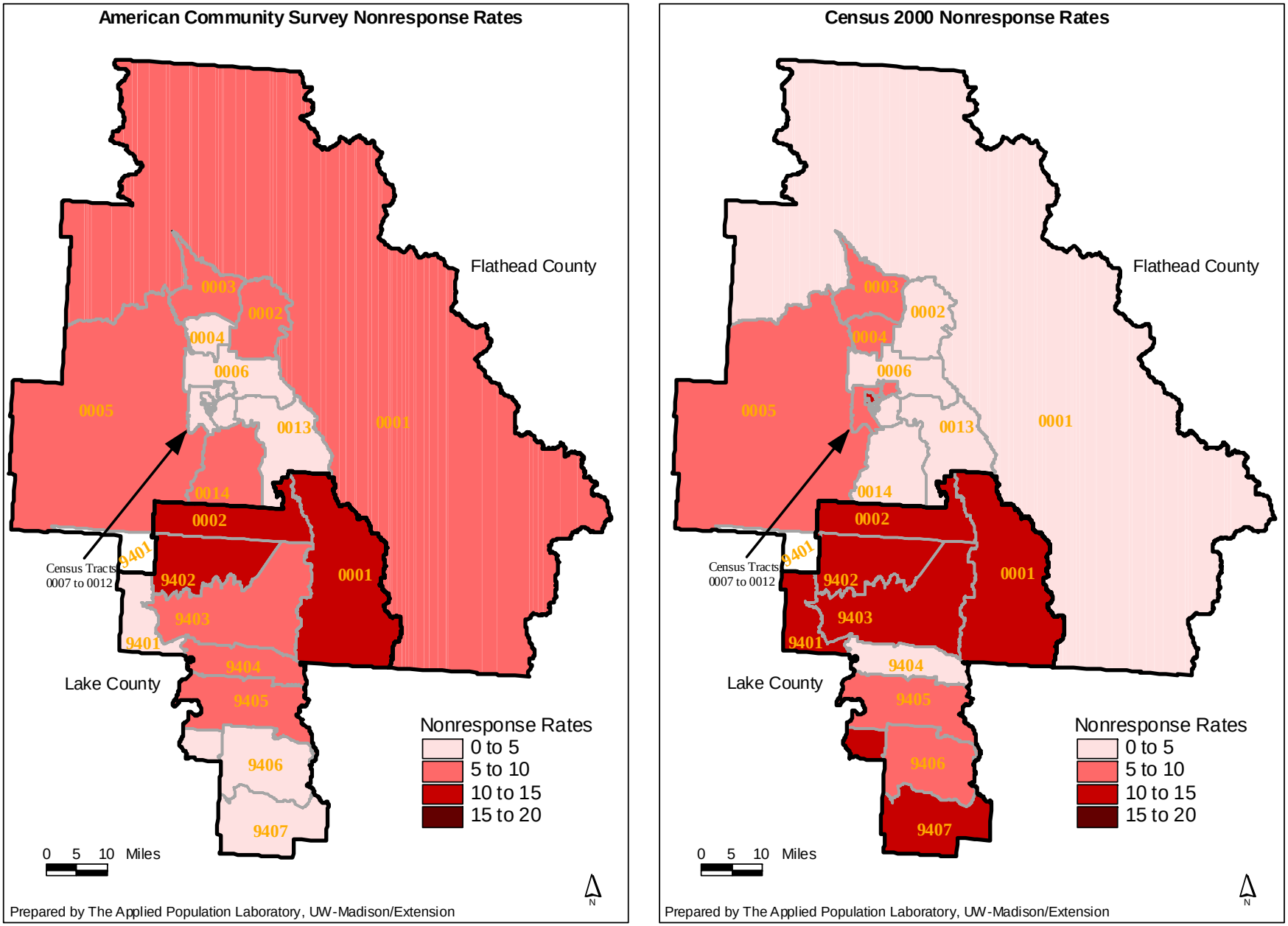


Figure 30

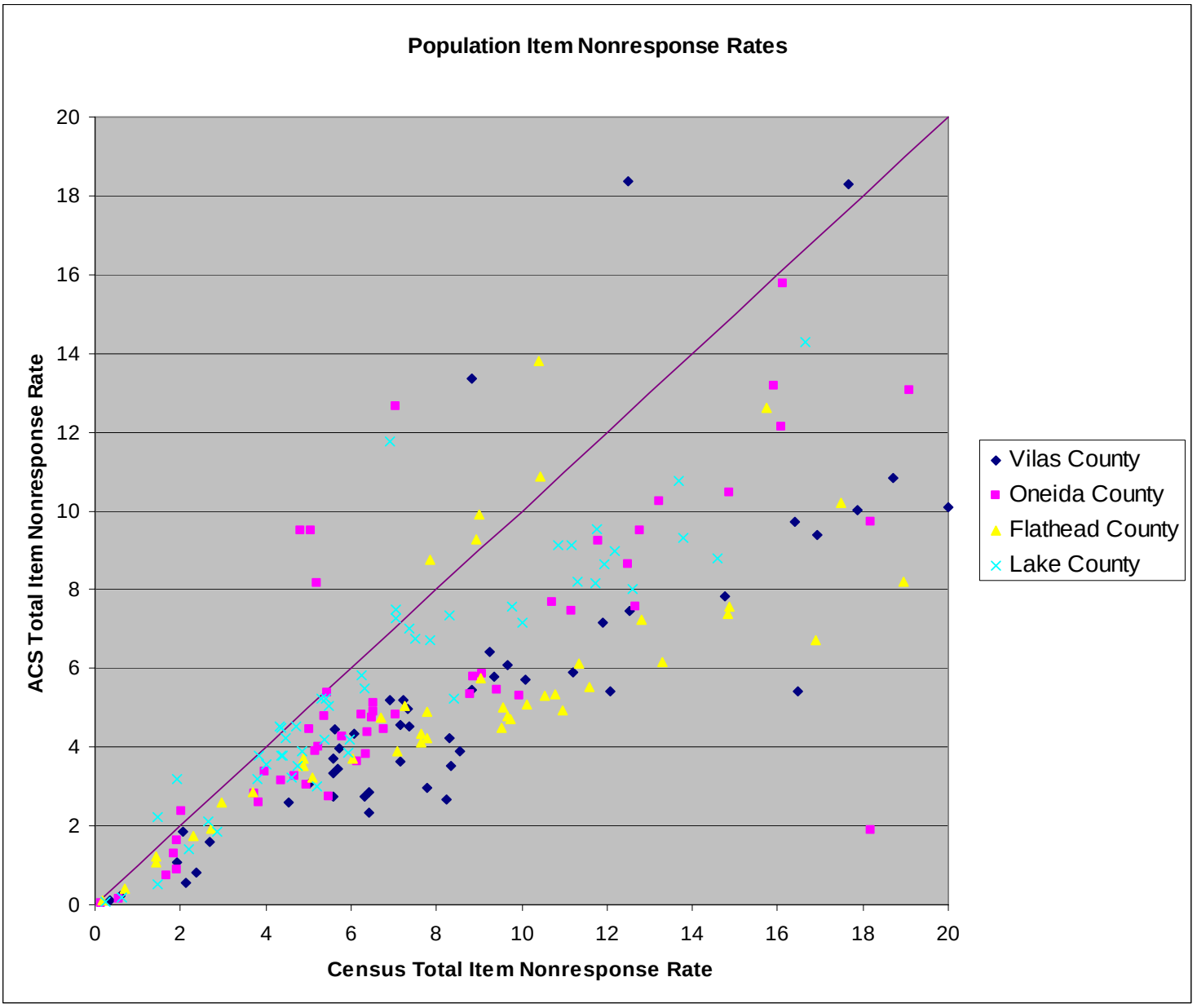
Montana Counties Nonresponse Rates



2. Item Non-response Rates

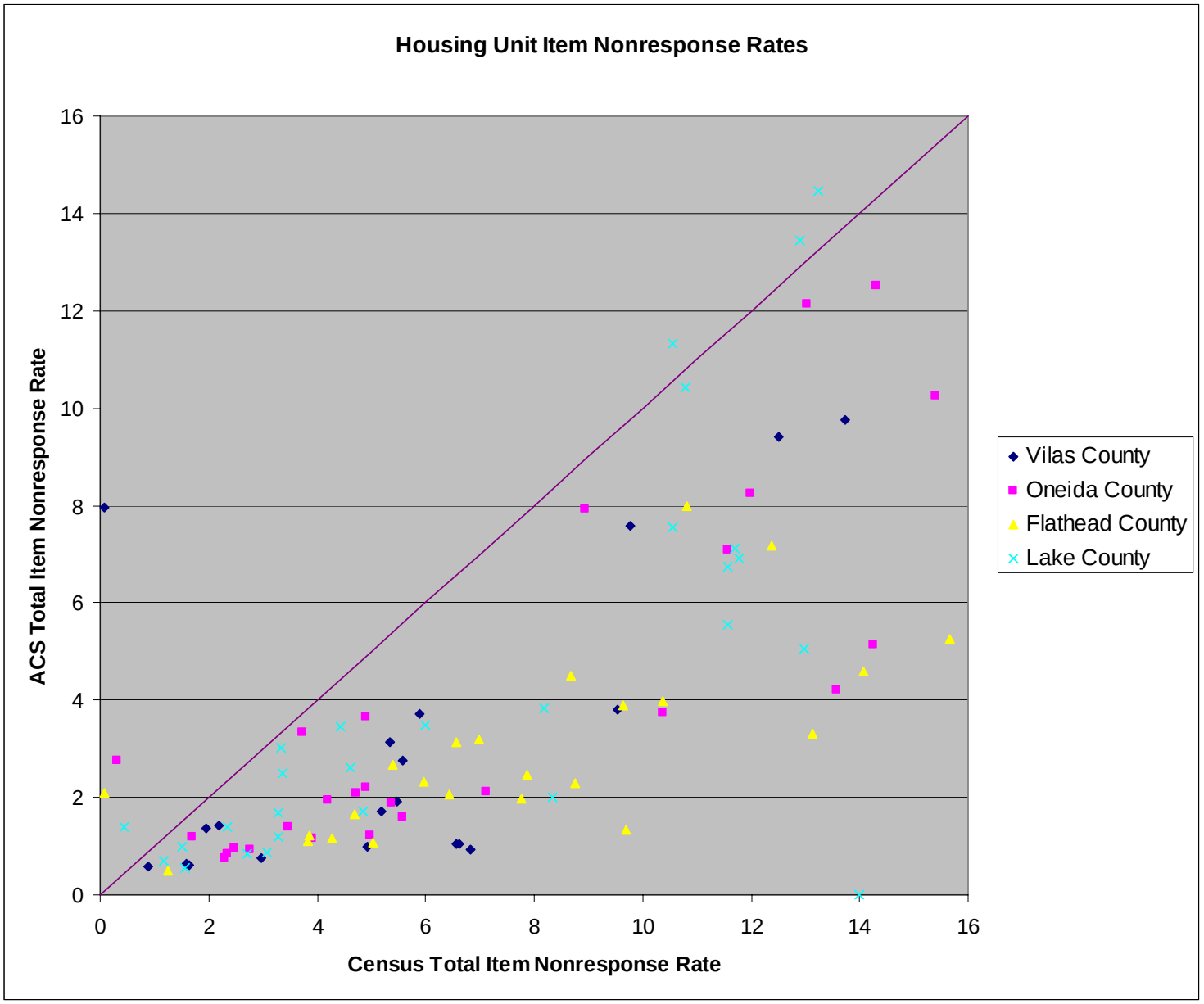
Total item non-response rates for each item in the ACS and long form questionnaires are compared in Figures 31 and 32. Item non-response occurs when a respondent fails to answer one or more questionnaire items for an interviewed housing unit, or fails to provide a valid response (U.S. Census 3, 2003). As demonstrated by the scatter plots, the ACS generally outperformed the long form on this quality measure, particularly for the housing unit total item non-response rates. There was relative consistency in the distribution of rates among the four counties, as evidenced by the fairly dense grouping of plots along the long form side of the diagonal. It appears that the ACS was relatively more successful with this measure in Vilas and Flathead Counties than in Oneida and Lake Counties.

Figure 31



There was greater variance among the rates of the four counties for the housing unit total item non-response (Figure 32). Once again, the ACS appears to have performed somewhat better for this measure in Vilas and Flathead Counties than in Oneida and Lake Counties.

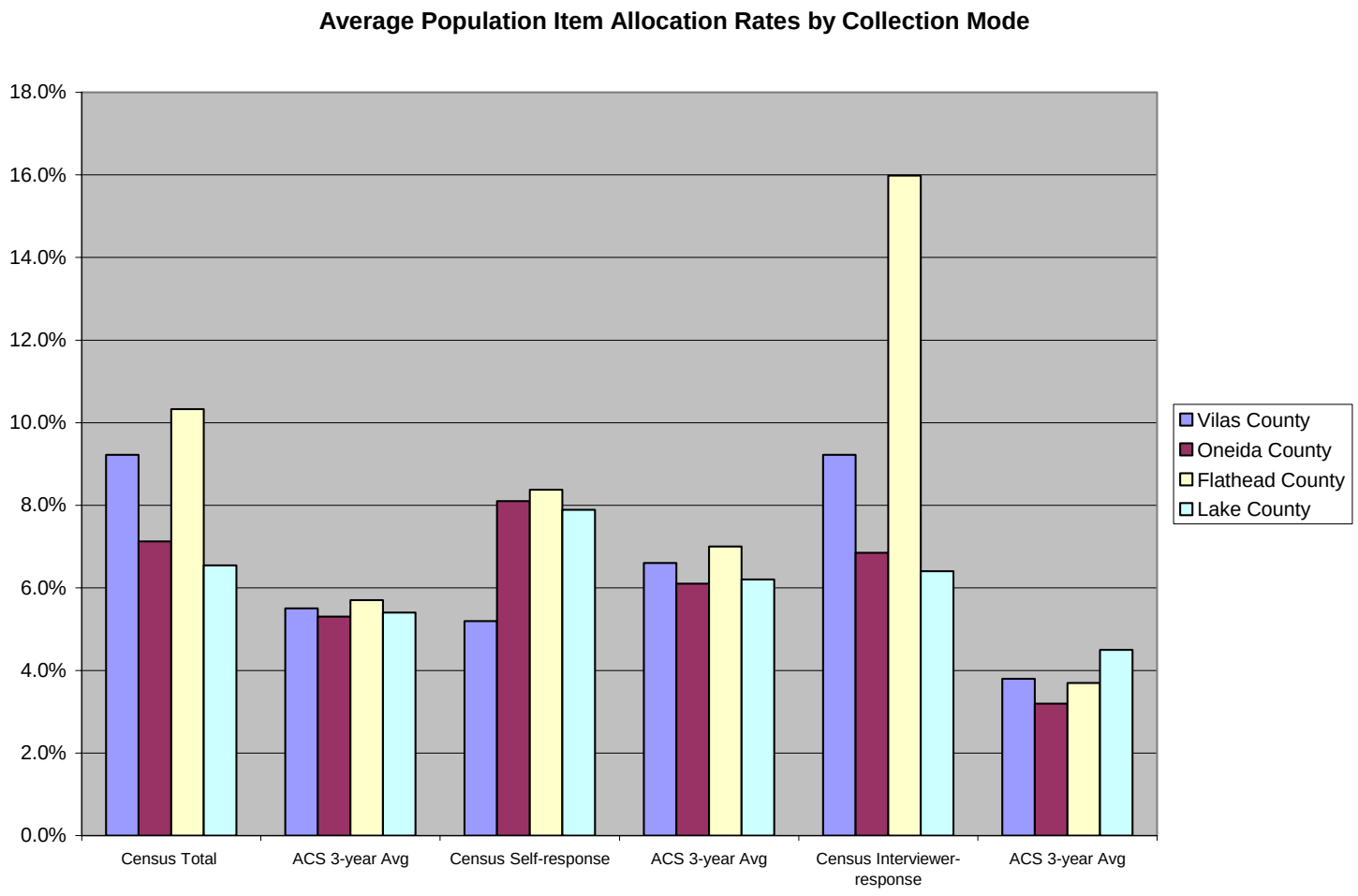
Figure 32



D. Item Allocation Rate

The allocation rate refers to the action taken by the Census Bureau to account for a respondent failing to answer one or more questions or not providing valid responses (U.S. Census Bureau 2003, 2). The Census Bureau uses statistical procedures, such as within-household or nearest neighbor matrices to impute, or assign responses, for missing values (U.S. Census Bureau 2003, 2). Essentially, answers from similar people or housing units for which the item information is correctly provided is used (U.S. Census Bureau 2003, 2). This measure is an important tool for further understanding the level of error in a survey. Item allocation rate is broken down by response mode at the county level (Figure 33). There are two response modes for which items are allocated: self-response and enumerator (interviewer) response.

Figure 33



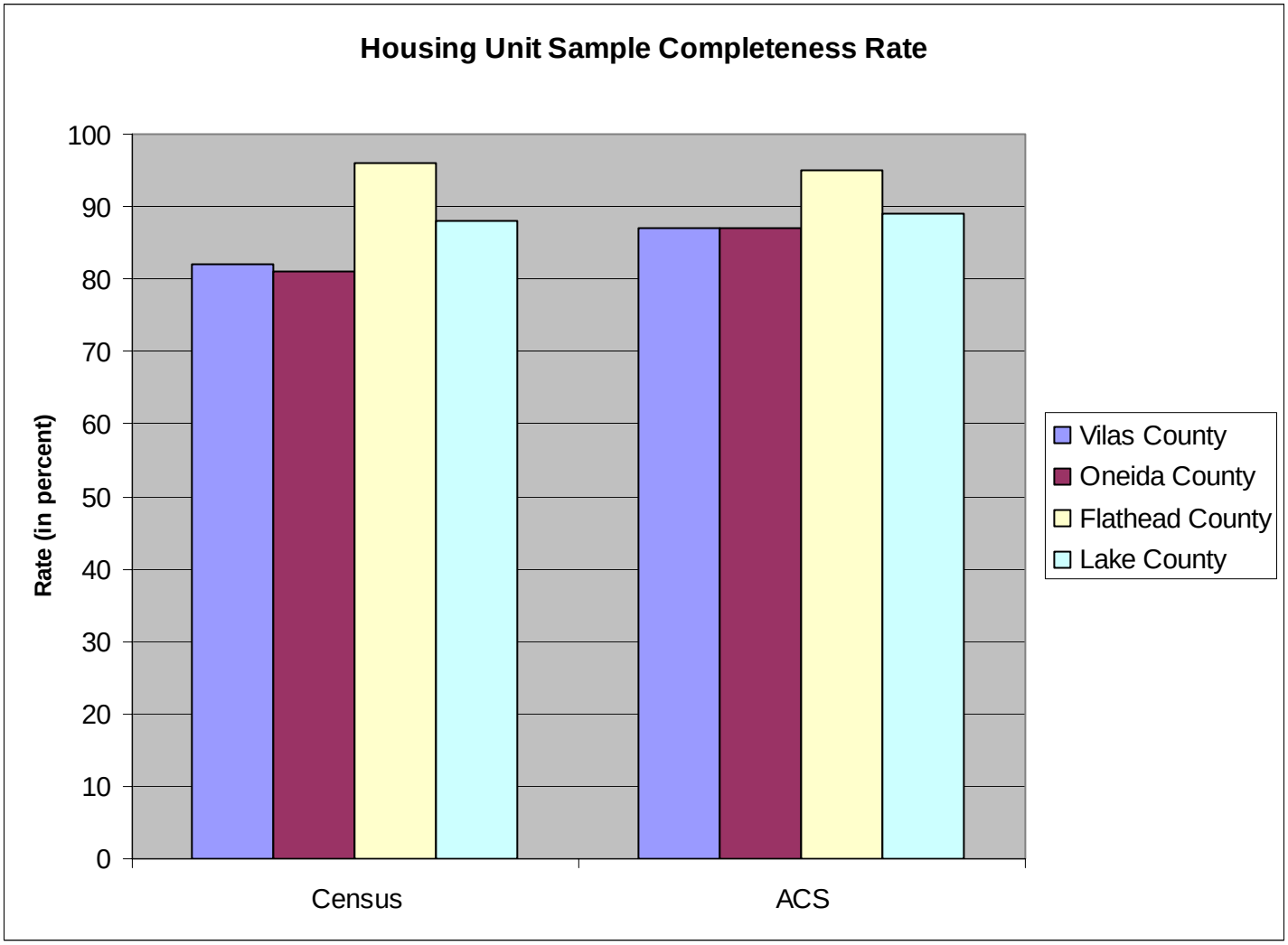
The ACS is producing less item allocation than did the 2000 long form, which directly translates into greater accuracy for ACS data. The critical result of this analysis is that the main source of difference between the census and the ACS in the "interviewer-response" item allocation results.

E. Sample Completeness Rate

Sample completeness measures the extent to which the interviewed survey sample represents the updated decennial census population estimate (U.S. Census Bureau 2003, 3). The sample completeness rates were provided for each county, but not for tracts. The 2000 long form sample completeness rates are based on a comparison of the number of long form sample data defined units and their population weighted by their probability of selection to the 100% housing unit count and household population count (Bench 2003). See Bench (2003) for further definitions of sample completeness rates.

The ACS fared better in the Wisconsin counties than the Montana counties for this quality measure as well. While the ACS had a significantly higher rate for this measure for both the household population sample and the housing unit sample in the Wisconsin counties, the rates were comparable to the long form rate in the Montana Counties (Figure 34).

Figure 34



IV. Conclusions

Do the data indicate that the ACS is a reasonable replacement to the census long form?

We have been asked to review the ACS data collected to date and compare it to the information provided by the 2000 census long form. Based on these data, we are unable to answer this question affirmatively at this juncture. Four primary reasons lie behind this conclusion:

1. For the ACS to meet its declared goals, the survey must provide statistically acceptable estimates of population and housing characteristics at the minor civil division (MCD) level. To date, the necessary ACS data, with which to make comparisons against the 2000 long form sample, have not been made available. We believe that MCD level data is critical to providing meaningful data for governmental units in rural areas.
2. In order to evaluate the full range of differences in attributes of the population between the long form and ACS samples, researchers must have access to uncontrolled estimates from the ACS, particularly in counties where differences in residency rules and survey design would yield very different population totals. In addition to the data to which we have had access to date, we would simply like to review the ACS numbers, properly weighted, but without the final control to the population and housing estimates. This would allow us to examine what the ACS implies in terms of numbers of people/housing units in addition to their characteristics.
3. The ACS samples for some of the counties included in this analysis are substantially smaller than those in the 2000 Census sample, thus yielding estimates with higher standard errors and more uncertainty, as is illustrated particularly in the case of Vilas County. This places the ACS at a distinct competitive disadvantage vis-à-vis the census long form. This results from a sampling error that has now been corrected.
4. One of the goals of the ACS as presently designed is to provide standard errors for ACS attribute estimates that exceed 2000 Census long form standard errors by no more than 33 percent at all levels of census geography. This goal appears to have been achieved at the county level (except for Vilas County as discussed in the previous paragraph). However, tract-level attribute standard errors for the ACS appear to substantially exceed those obtained in the long form by more than 33 percent.

As demographers working to provide user-friendly data for state, county, and local users, we recognize that these key concerns can be addressed. The ACS clearly has the potential to not only be an adequate replacement of the long form, but in fact, to be an improvement. County and municipal leaders in counties like those examined herein have long complained that an April-based census fails to properly reflect the actual population of their counties and communities. If the concerns we have addressed are corrected, the ACS should, in fact, be a fairer portrayal of the true population in these counties, as the results of the analysis of the attribute data presented in Section II suggest. The same can be said for Flathead and Lake Counties, but perhaps to a lesser extent.

Finally, while sampling error is a strong concern, based on the analysis presented in Section III, it appears that with the appropriate levels of funding and publicity devoted to it, the ACS will match or exceed the performance of the long form in regards to data quality.

References

Bench, Katie (2003). *Census 2000 Sample Data and ACS 3-year Averages Quality Measures Comparison Documentation Planning,* Research, and Evaluation Division, U.S. Census Bureau.

Diffendal, Gregg (2004), U.S. Census Bureau. Email clarifying ACS data reliability from February 26, 2004.

Flathead County Planning and Zoning Office; "About the Flathead Valley;" last revised August 28, 2002; <http://www.co.flathead.mt.us/frdo/bckgrd.html>.

Great Lakes Intertribal Council website; "Lac du Flambeau Band of Lake Superior Chippewa;" < http://glitc.bfm.org/tribes/lac_du_flambeau/default.php>; (accessed: September 15, 2003).

Hubble, David (2003), U.S. Census Bureau. Email clarifying ACS sampling plan from December 22, 2003.

Love, Susan (2003, 1), U.S. Census Bureau. Email clarifying long form/ACS residency rules from October 14, 2003.

Love, Susan (2003, 2), U.S. Census Bureau. Email clarifying self-response rate from December 31, 2003.

Marcouiller, David W., John Gregory Clendenning, and Richard Kedzior (2002). "Natural Amenity-Led Development and Rural Planning," in *Journal of Planning Literature,* Vol. 16, No.4 (May 2002). Sage Publications. pp. 516-542.

Mattmiller, Brian; "Census Improvement Earns Voss a White House 'Hammer';" posted June 24, 1999; <http://www.news.wisc.edu/.view.html?get=208>.

Merril, Andrea and Judy Jacobson (1997). *Montana Almanac,* Falcon Publishing Co., Inc., Helena and Billings, MT.

Montana Research and Analysis Bureau; "County Profiles;" published November 11, 2002; <http://rad.dli.state.mt.us/county/lake/default.asp?data=descrip>.

Reeder, Richard (1998). "Retiree-Attraction Policies for Rural Development." Agriculture Information Bulletin No. 741. Washington, D.C.: Food and Rural Economics Division, Economic Research Service, U.S. Department of Agriculture.

Shields, Martin, Steven C. Deller, and Judith I. Stallman (1998). *The Impact of Retirees and Working-Age Families on a Small Rural Region: An Application of the Wisconsin Economic Impact Modeling System***,** Faculty Paper Series, Faculty Paper 99-1. Prepared for presentation at the 45th North American Meetings of the Regional Science Association International, Santa Fe, NM, November 11-14, 1998.

Spar, Edward; "The American Community Survey: Where it Currently Stands;" <http://members.aol.com/copafs/acs.htm>; (accessed December 12, 2003).

State of Wisconsin Department of Workforce Development; "Vilas County Workforce Profile;" published October 2002 (revised 3/2003); < http://www.dwd.state.wi.us/lmi/cp_pdf/v125cpw.pdf>

Symens Smith, Amy (1998). "The American Community Survey and Intercensal Population Estimates: Where Are The Crossroads." Population Division Technical Working Paper No. 31. Washington, D.C.: U.S. Bureau of the Census.

Taeuber, Cynthia (2000). "The American Community Survey." *Population Today,* Volume 28, Number 8, November/December 2000. Washington, D.C.: Population Reference Bureau.

U.S. Census Bureau (2003, 1); "2000 U.S. Census of Population and Housing, Summary File 1"; generated on September 15, 2003 by Paul Van Auken using Census 2000 Gateway; <http://www.census.gov/main/www/cen2000.html>.

U.S. Census Bureau (2003, 2); "Survey Basics: What is the American Community Survey?;" last revised September 11, 2003; < http://www.census.gov/acs/www/SBasics/What/goals.htm>.

U.S. Census Bureau (2003, 3): "Advanced Methodology: Quality Measures;" last revised October 1, 2003; <http://www.census.gov/acs/www/AdvMeth/QM.htm>.

U.S. Census Bureau (2003, 4): "1990 Census Summary Tape File 3"; generated on September 15, 2003 by Paul Van Auken using 1990 Census Lookup; <http://homer.ssd.census.gov/cdrom/lookup>.

U.S. Congress (2000). *The American Community Survey – A Replacement for the Census Long Form?* Hearing before the Subcommittee on the Census of the Committee on Government Reform, House of Representatives, 106th Congress, second session, July 20, 2000. Serial No. 106-246. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Housing and Urban Development (HUD) (2002). *The American Community Survey: Challenges and Opportunities for HUD.* The Department of Housing and Urban Development under Task Order 2 of C-OPC-21762. Calverton, Maryland: HUD.

U.S. General Accounting Office (GAO 2002). *2000 Census: Lessons Learned for Planning a More Cost-Effective 2010 Census,* Report to Congressional Requesters, GAO-03-40, October 2002. Washington, D.C.: General Accounting Office.

Wirtz, Ronald A. (2002). "More Than Just a Pretty Place?" in *fedgazette***,** Federal Reserve Bank of America, November 2002; <http://minneapolisfed.org/pubs/fedgaz/02-11/rural.cfm>.

Wisconsin Department of Administration (DOA) (2003). "Tenure and Vacancy Status of Housing Units for Wisconsin Counties and Municipalities: April 1, 2000"; <http://www.doa.state.wi.us/docs_view2.asp?docid=393>; (accessed December 12, 2003).

Appendix A

Breakdown of Significant Differences in Relevant Attributes

LEGEND:

- ***"Higher" or "Lower" refers to the comparison of the attribute from Census to ACS (e.g. when the proportion or median was higher in ACS for the attribute, the difference is referred to as "Higher")***
- ***Significant at p <= 0.01 level = ******
- ***Significant at p<=0.05 level = *****
- ***All analysis is based on Proportions unless otherwise indicated as being Averages or Medians***
- ***Attributes of particular interest are underlined***

The authors tabulated the number of significant differences a the 99 and 95 percent confidence level for all attributes – not only those that fit within the indicator matrix – relevant to their hypotheses as presented below.

i. Oneida County:
   1. *Two or more attributes with significant difference at p<= 0.01 level*: Overall, Oneida County had 6 attributes that demonstrated a significant difference out of the 363 total comparisons. All of these differences were in the expected direction. Census Tract 970100 had 3 such attributes, 2 in the expected direction; Tract 970500 had 3, 3; Tract 970600 had 2,2; Tract 971400 had 3,3; and Tract 971500 had 2,2.
   2. *Five or more variables significant at p<=0.05 level:* Tract 971500 had 10,8; Tract 970500 had 8,8; and Tract 970100 had 6,6.

ii. Vilas County:
   1. *Two or more variables significant at p<= 0.01 level*: Overall, Vilas County had 10 attributes that demonstrated a significant difference, all of which were in the expected direction. Tract 950400 had 3 such attributes, all in the expected direction
   2. *Five or more variables significant at p<=0.05 level:* Overall, Vilas County had 7 attributes that demonstrated a significant difference, all of which were in the expected direction. Tract 950100 had 6, 5 in expected direction.

iii. Flathead County:
   1. *Two or more variables significant at p<= 0.01 level*: Overall, Flathead County had 2 attributes that demonstrated a significant difference, one of which was in the expected direction. The tract level results are as follows: 000100 (2,1), 000500 (4,0), 001300 (2,2), 001400 (2,2)
   2. *Five or more variables significant at p<=0.05 level:* Tract 001100 had 5,4 and Tract 000200 had 8,6. Flathead County overall had only 4 such attributes, 3 in the expected direction.

iv. Lake County:
   1. *Two or more variables significant at p<= 0.01 level*: Overall, Lake County had 5 attributes that demonstrated a significant difference, 4 of which were in the expected direction. The tract level results are as follows: Tract 000100 (2,2); 000200 (2,0); 940300 (2,2); 940400 (2,2)

2. *Five or more variables significant at p<=0.05 level:* Overall, Lake County had 7 such attributes, all of which were in the expected direction. The tract level results are as follows: Tract 940300 (5,4) Tract 940600 (5,3).

- *HOUSEHOLDS AND UNITS:*

  - TOTAL HOUSEHOLDS (Expected Direction: HIGHER):
    - Vilas and Oneida:
      - Significantly*** HIGHER in Vilas and Oneida County overall
        - Significantly*** HIGHER in 0 of 5 Vilas tracts, and 2 of 11 Oneida tracts individually
      - Not a significant** difference in either county overall
        - Significantly** HIGHER in 1 of 5 Vilas tracts, and 2 of 11 Oneida tracts
      - TOTAL FAMILIES were significantly** HIGHER in 1 Vilas tract
    - Lake and Flathead:
      - Not a significant*** difference in Lake or Flathead County overall
        - Significantly*** LOWER in 2 of 14 Flathead tracts, no significant*** difference in any of the 9 Lake tracts
      - Not a significant** difference in Lake or Flathead County overall
        - Significantly** LOWER in 1 of 14 Flathead tracts, no significant** difference in any Lake tract
      - FAMILY HOUSEHOLDS was significantly** HIGHER in 1 Flathead tract

  - TOTAL HOUSING UNITS (Expected Direction: HIGHER):
    - Vilas and Oneida:
      - Not a significant*** difference in Vilas or Oneida County overall
        - Significantly*** HIGHER in 0 of 5 Vilas tracts, 1 of 11 Oneida tracts
      - Not a significant** difference in Vilas or Oneida County overall
        - Significantly** HIGHER in 0 of 5 Vilas tracts, 1 of 11 Oneida tracts, DOWN significantly in 1 of 1l Oneida tracts
    - Lake and Flathead:
      - Not a significant *** difference in Lake or Flathead County overall
        - Significantly*** LOWER in 2 of 14 Flathead tracts, no significant*** difference in any of the 9 Lake tracts
      - Not a significant ** difference in Lake or Flathead County overall
        - Significantly** LOWER in 1 of 14 Flathead tracts and 1 of 9 Lake tracts

  - <u>OCCUPIED HOUSING UNITS</u> (Expected Direction: HIGHER):
    - Vilas and Oneida:
      - Significantly*** HIGHER in Vilas and Oneida County overall
        - Significantly*** HIGHER in 2 of 5 Vilas tracts (950300 – "OCCUPANCY," 950400) and 5 of 11 Oneida tracts (970100, 970500, 970600, 971100, 971400)

            - Significantly** HIGHER in 3 Oneida tracts (971500, 970500, 970100) and 1 Vilas tract (950300 – "TENURE"), significantly** LOWER in 1 Oneida tract (970800)
        - Lake and Flathead:
            - Not a significant*** difference in Lake or Flathead County overall
                - Significantly*** HIGHER in 1 of 14 Flathead tracts (001300), significantly*** LOWER in 1 of 14 Flathead tracts (000500)
            - Not a significant** difference in Lake or Flathead County overall
                - Significantly** HIGHER in 1 Lake tract (940300), Significantly** LOWER in 2 Flathead tracts (000800, 000200) and 1 Lake tract (940600)

    - VACANT HOUSING UNITS (Expected Direction: LOWER):
        - Vilas and Oneida:
            - Significantly*** LOWER in both Vilas and Oneida County overall
                - Not a significant*** difference in any Vilas or Oneida tract individually
            - Not a significant** difference in Vilas or Oneida County overall or any tract individually
        - Lake and Flathead:
            - Not a significant*** difference in Lake or Flathead counties overall or in any of their tracts individually
            - Not a significant** difference in Lake or Flathead County overall
                - Significantly** LOWER in 1 Flathead County tract, no Lake County tracts demonstrated any significant** difference

    - AVERAGE HOUSEHOLD SIZE OF OCCUPIED UNIT (Expected Direction: LOWER, based on the retiree-destination component of the hypothesis):
        - Vilas and Oneida:
            - Significantly*** LOWER in both Vilas and Oneida County overall
                - Not a significant*** difference in Vilas or Oneida tract individually
            - Not a significant** difference in Vilas or Oneida County overall or any tract individually
        - Lake and Flathead:
            - Not a significant*** difference in Lake or Flathead counties overall or in any of their tracts individually
            - Not a significant** difference in Lake or Flathead counties overall or in any of their tracts individually

- *AGE, POPULATION, RACE:*

    - POPULATION 62 YEARS AND OLDER (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
        - Vilas and Oneida:
            - Not a significant*** or significant** difference in Vilas or Oneida counties overall or in any of their tracts individually

        - Lake and Flathead:
            - Not a significant*** difference in Lake or Flathead counties overall
                - Significantly*** HIGHER in 1 of 9 Lake tracts, not a significant*** difference in any of the 14 Flathead tracts
            - Significantly** LOWER in 1 Flathead tract and 1 Lake tract

- POPULATION 60-64 (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
    - Vilas and Oneida:
        - Not a significant*** or significant** difference in Vilas or Oneida counties overall or in any of their tracts individually
    - Lake and Flathead:
        - Significantly*** HIGHER in 1 Flathead tract (001300), Significantly** LOWER in 1 Flathead tract (000100)

- POPULATION 65-74 (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
    - Vilas and Oneida:
        - Not a significant*** or significant** difference in Vilas or Oneida counties overall or in any of their tracts individually
    - Lake and Flathead:
        - Significantly** LOWER in 1 Flathead tract

- HOUSEHOLD POPULATION 65 YEARS AND OLDER (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
    - Vilas and Oneida:
        - Not a significant*** difference in Vilas or Oneida counties overall or in any of their tracts individually
    - Lake and Flathead:
        - Significantly*** HIGHER in Lake County overall, not a significant*** difference in Flathead county overall
            - Significantly*** HIGHER in 1 of 9 Lake tracts, not a significant*** difference in any of the 14 Flathead tracts
        - Not a significant** difference in Lake or Flathead County overall
            - Significantly** HIGHER in 1 Lake tract

- MEDIAN AGE (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
    - Vilas and Oneida:
        - Not a significant*** difference in Vilas or Oneida County overall or in any of their tracts individually
        - Not a significant** difference in Vilas or Oneida County overall
            - Significantly** HIGHER in 1 Oneida tract
    - Lake and Flathead:
        - Not a significant*** difference in Lake or Flathead counties overall

        - Significantly*** HIGHER in 1 of 14 Flathead tracts, not a significant*** difference in any of the 9 Lake tracts
    - Not a significant** difference in Lake or Flathead County overall or in any individual tract

- MEXICAN POPULATION (Expected Direction: HIGHER, based on the possibility that this would represent seasonal workers):
  - Vilas and Oneida:
    - No significant*** or ** difference
  - Lake and Flathead:
    - Significantly** HIGHER in 1 Flathead tract (001100)

- POPULATION 5 YEARS AND OVER (Expected Direction: HIGHER):
  - Vilas and Oneida:
    - Significantly** HIGHER in Vilas County Overall
  - Lake and Flathead:
    - No significant*** or ** difference

- POPULATION 25 YEARS AND OVER (Expected Direction: HIGHER):
  - Vilas and Oneida:
    - Significantly** HIGHER in 1 Vilas tract
  - Lake and Flathead:
    - No significant*** or ** difference

- POPULATION 65 YEARS + WITH DISABILITY (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
  - Significantly** HIGHER in 1 Oneida tract (970500)

- *HOUSING – COSTS, VALUE and OTHER:*

- <u>MEDIAN GROSS RENT</u> (Expected Direction: HIGHER):
  - Vilas and Oneida
    - Not a significant*** difference in Vilas or Oneida counties overall
      - Significantly*** HIGHER in 1 of 5 Vilas Tracts, Significantly*** HIGHER in 1 of 11 Oneida tracts
    - Significantly** HIGHER in Oneida County overall and in 1 Oneida tract
      - Not a significant** difference in Vilas County or any Vilas tract
  - Lake and Flathead
    - Not a significant*** difference in Lake or Flathead counties overall
      - Significantly*** HIGHER in 1 of 9 Lake tracts, not a significant*** difference in any of the 14 Flathead tracts
    - Significantly** HIGHER in Lake County overall and in 1 Lake tract
      - Significantly** LOWER in 1 Flathead tract (001000)

- OTHER HOUSING COSTS VARIABLES
  - <u>MEDIAN MORTGAGE</u> (Expected Direction: HIGHER):

        - Significantly*** HIGHER in Vilas County overall and 1 Vilas tract, and 1 Lake tract
        - Significantly** HIGHER in 2 Vilas and 2 Oneida tracts
        - Significantly** LOWER in 2 Flathead tracts
    - MORTGAGES FROM $1,500-$1,999/MO. (Expected Direction: HIGHER):
        - Significantly** HIGHER in 1 Oneida tract
    - MORTGAGES FROM $1,000-$1,499/MO. (Expected Direction: HIGHER)
        - Significantly** HIGHER in 1 Lake tract
        - Significantly** LOWER in 1 Flathead tract
    - MORTGAGE AS A PERCENTAGE OF HOUSEHOLD INCOME – 35% AND HIGHER (Expected Direction: HIGHER):
        - Significantly*** HIGHER in 1 Flathead tract
        - Significantly** HIGHER in 2 Oneida tracts
        - Significantly** LOWER in 1 Flathead tract
    - MORTGAGE AS A PERCENTAGE OF HOUSEHOLD INCOME – 30-34.9% (Expected Direction: HIGHER):
        - Significantly** HIGHER in Vilas County overall and 1 Vilas tract
    - MORTGAGE AS A PERCENTAGE OF HOUSEHOLD INCOME – LESS THAN 20% (Expected Direction: LOWER)
        - Significantly** LOWER in 1 Flathead tract
    - GROSS RENT AS A PERCENTAGE OF MONTHLY HOUSEHOLD INCOME – 35% AND HIGHER (Expected Direction: HIGHER)
        - Significantly** HIGHER in 1 Flathead tract

- <u>MEDIAN VALUE OF HOUSING</u> (Expected Direction: HIGHER):
    - Vilas and Oneida
        - Significantly*** HIGHER in Vilas County overall, not a significant*** difference in Oneida County overall
            - Significantly*** HIGHER in 1 Vilas tract, not a significant*** difference in any Oneida tract
        - Significantly** LOWER in 1 Oneida tract
    - Lake and Flathead
        - Not a significant*** difference in Lake or Flathead counties overall
            - Significantly*** HIGHER in 1 of 9 Lake tracts
                - UP by 96% in this tract (000100), with a population of 1,300 according to the census and 1,177 according to the three-year ACS average.
                    - This merits further investigation.
            - Significantly*** HIGHER in 1 of 14 Flathead tracts
            - Significantly** HIGHER in 1 Lake tract

- OTHER HOUSING VALUE VARIABLES
    - VALUE AT $150-199K (Expected Direction: HIGHER):
        - Significantly*** HIGHER in 1 Oneida tract
    - VALUE AT $200-299K (Expected Direction: HIGHER):

            - Significantly** HIGHER in Vilas County overall and in 1 Vilas tract
            - Significantly** LOWER in 1 Flathead tract (000600)
        - VALUE AT $300-499K (Expected Direction: HIGHER):
            - Significantly** HIGHER in 1 Oneida tract
            - Significantly** HIGHER in 1 Flathead tract

    - MISCELLANEOUS HOUSING:
        - MOBILE HOMES (Expected Direction: HIGHER, as this may represent vacation homes):
            - Significantly*** HIGHER in Oneida County overall and 1 Vilas tract
            - Significantly** HIGHER in Vilas County overall and 1 Oneida tract and 1 Lake tract
        - LACKING COMPLETE PLUMBING FACILITIES (Expected Direction: HIGHER, as it may relate to cabins)
            - Significantly** HIGHER in 1 Lake tract (940600)

- *INCOME:*

    - MEDIAN HOUSEHOLD INCOME (Expected Direction: HIGHER, based on the notion that seasonal/vacation residents would have higher incomes):[15]
        - Significantly*** HIGHER in Lake County overall and in 1 of 9 Lake tracts, Significantly*** LOWER in 1 of 14 Flathead tracts
    - MEDIAN FAMILY INCOME (Expected Direction: HIGHER, based on the notion that seasonal/vacation residents would have higher incomes):
        - Significantly*** LOWER for 1 of 14 Flathead tracts
        - Significantly** HIGHER in Oneida and Lake counties overall
            - Significantly** HIGHER in 1 Lake tract
    - HOUSEHOLDS WITH SOCIAL SECURITY INCOME (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
        - Significantly** HIGHER in Flathead County overall
    - MEDIAN INCOME OF FEMALE YEAR-ROUND WORKERS (Expected Direction: HIGHER, based on the notion that seasonal/vacation residents would have higher incomes):
        - Significantly*** HIGHER in 1 of 11 Oneida tracts, Significantly*** HIGHER in 1 of 14 Flathead tracts
        - Significantly** HIGHER in 1 Flathead tract
        - Significantly** LOWER in 1 Oneida tract and 1 Vilas tract
    - MEDIAN INCOME OF MALE YEAR-ROUND WORKERS (Expected Direction: UNCERTAIN, based on the notion that seasonal/vacation residents would have higher incomes, but increased demand for services engender lower wage jobs for other residents):
        - Significantly** LOWER in 1 Oneida tract and 1 Lake tract
    - MEAN EARNINGS (Expected Direction: UNCERTAIN, based on the notion that seasonal/vacation residents would have higher incomes, but increased demand for services engender lower wage jobs for other residents):

[15] It should be noted, however, low-wage seasonal workers may also be an important factor.

        - DOWN significantly** in 1 Oneida tract
    - HOUSEHOLDS WITH RETIREMENT INCOME (Expected Direction: HIGHER, based on the retiree-destination component of the hypothesis):
        - Significantly** HIGHER in 1 Vilas tract, 1 Lake tract, and 1 Flathead tract
        - Significantly** LOWER in 1 Lake tract (000200)
    - HOUSEHOLD INCOME FROM $100-149.9K (Expected Direction: HIGHER, based on the notion that seasonal/vacation residents would have higher incomes):
        - Significantly** HIGHER in 1 Flathead tract
    - FAMILY INCOME FROM $100-149.9K (Expected Direction: HIGHER, based on the notion that seasonal/vacation residents would have higher incomes):
        - Significantly** HIGHER in 1 Flathead tract
    - FAMILY INCOME FROM $150-199.9K (Expected Direction: HIGHER, based on the notion that seasonal/vacation residents would have higher incomes):
        - Significantly** HIGHER in 1 Flathead tract

- *EMPLOYMENT*

    - EMPLOYMENT STATUS
        - POP. 16+ IN LABOR FORCE (Expected Direction: UNCERTAIN, as HIGHER might suggest that more workers living and working in the area for seasonal periods have been captured, while LOWER might suggest a net higher retiree population):
            - Significantly** LOWER in 1 Oneida tract and 1 Flathead tract
        - POP. 16+ EMPLOYED (Expected Direction: UNCERTAIN, as HIGHER might suggest that more seasonal workers have been captured, while LOWER might suggest a higher retiree population):
            - Significantly*** LOWER in 1 Oneida tract (971500)
        - POP. 16+ NOT IN LABOR FORCE (Expected Direction: HIGHER for primary hypothesis, as HIGHER might suggest a higher retiree population, while as LOWER might suggest that more seasonal workers have been captured):
            - Significantly*** HIGHER in 1 Oneida tract (971500)
        - FEMALES 16+ EMPLOYED (Expected Direction: LOWER for primary hypothesis, as LOWER might suggest a higher retiree population, while HIGHER might suggest that more seasonal workers have been captured):
            - Significantly*** LOWER in 1 Lake tract (940400)
        - WORKERS 16+ (Expected Direction: UNCERTAIN, as HIGHER might suggest that more seasonal workers have been captured, while LOWER might suggest a higher retiree population):
            - Significantly** LOWER in 1 Vilas tract
    - INDUSTRY:
        - CONSTRUCTION (Expected Direction: HIGHER, as is seasonal work):
            - Significantly** HIGHER in 1 Oneida tract
        - INFORMATION (Expected Direction: HIGHER, as might suggest telecommuting done by seasonal residents from vacation homes):
            - Significantly** HIGHER in Lake County overall

        - RETAIL TRADE (Expected Direction: HIGHER, as there may be more demand for retail during seasonal periods):
            - Significantly** LOWER in Flathead County overall and in 1 Flathead tract (001000), and in 1 Oneida tract (970800)
        - PROFESSIONAL, SCIENCE, MANAGEMENT, ETC. (Expected Direction: HIGHER, as may point to more professional seasonal/vacation residents)
            - Significantly*** HIGHER in Flathead County overall, Significantly*** LOWER in 1 Oneida tract
            - Significantly** HIGHER in 1 Vilas tract and 1 Flathead tract
        - ARTS, ENTERTAINMENT, RECREATION, ETC. (Expected Direction: HIGHER, as there may be more demand for this during seasonal periods)
            - Significantly*** LOWER in 1 Flathead tract
            - Significantly** HIGHER in Vilas County overall and in 1 Vilas tract, Significantly** LOWER in 1 Flathead tract
        - EDUCATION, HEALTH, SOCIAL SERVICES, ETC. (Expected Direction: HIGHER, as there may be more demand for health and social services during seasonal periods)
            - Significantly*** LOWER in 1 Flathead tract (000500)
    - OCCUPATION:
        - CONSTRUCTION, EXTRACTION, MAINTENANCE (Expected Direction: HIGHER, as is seasonal work):
            - Significantly** HIGHER in 1 Oneida tract
        - MANAGEMENT, PROFESSION, AND RELATED (Expected Direction: HIGHER, as may point to more professional seasonal/vacation residents)
            - Significantly*** LOWER in 1 Lake tract (000200)
        - COMMUTING TO WORK – MEAN TRAVEL TIME (Expected Direction: HIGHER, as may point to rural sprawl)
            - Significantly** HIGHER in Lake County overall

- *EDUCATIONAL ATTAINMENT*

    - NUMBER WITH BACHELOR'S DEGREE (Expected Direction: UNCERTAIN, as seasonal/vacation residents may be expected to be better educated, but retirees come from an era when obtaining a college degree was more rare):
        - Significantly** HIGHER in 1 Oneida tract
    - PERCENT WITH BACHELOR'S DEGREE OR HIGHER (Expected Direction: UNCERTAIN, as seasonal/vacation residents may be expected to be better educated, but retirees come from an era when obtaining a college degree was more rare):
        - Significantly*** HIGHER in Vilas County overall, Significantly*** LOWER in 1 Flathead tract (001400)
        - Significantly** HIGHER in 1 Vilas tract, Significantly** LOWER in 2 Oneida tracts (971300, 971500)
    - GRADUATE SCHOOL OR PROFESSIONAL DEGREE (Expected Direction: UNCERTAIN, as seasonal/vacation residents may be expected to be better educated, but retirees come from an era when obtaining a college degree was more rare):
        - Significantly*** HIGHER in Vilas County overall and 1 Vilas tract

        - Significantly** HIGHER in 1 Vilas tract and 1 Flathead tract

- *EDUCATIONAL ENROLLMENT*

    - COLLEGE OR GRADUATE SCHOOL (Expected Direction: HIGHER, as this may point to students home for the summer)
        - Significantly*** HIGHER in 1 Oneida tract

Appendix B

Detailed Quality Measures Analysis

I. Self Response Rate

A summary of the rates in each county is presented below.

- Vilas County:
  - Self-response rate was not provided for the long form, as the entire county was fully list enumerate in 2000. The overall county ACS self-response rate was 56.6%
    - High ACS rate: 61.1% in tract 950200
    - Low ACS rate: 44.7% in tract 950300.
- Oneida County:
  - The overall county ACS self-response rate was 71.6%, but based on a small fraction of addresses, compared to 78% for the long form
    - High ACS rate: 78.1% in tract 97100 (compared to 79.8% for long form in that tract)
    - Low ACS rate: 47.4% in tract 970800 (compared to 76.6% for long form in that tract)
    - High long form rate: 90% in tract 971100 (compared to 77.8% for ACS in that tract)
    - Low long form rate: 56.1% in tract 970600 (compared to 71.5% for ACS in that tract)
  - Of the tracts that had rates for both ACS and long form, the rate was higher for long form in 6 of 7
- Flathead County:
  - The overall county ACS rate was 60.1% compared to 72.9% for long form
    - High ACS rate: 72.9% in tract 000900 (compared to 81.1% for long form for that tract)
      - Tract 9401, with a population of 19 people, had 100% ACS rate and no long form rate provided
    - Low ACS rate: 38.8% in tract 000100 (compared to 68% for long form for that tract)
    - High LF rate: 81.1% in tract 000900 (compared to 72.9% for ACS for that tract)
    - Low LF rate: 65.9% in tract 000700 (compared to 58.71% for ACS for that tract)
  - Of the tracts that had rates for both ACS and long form, the rate was higher for long form in 14 of 14
- Lake County:
  - The overall county ACS rate was 52.4% compared to 74.5% for long form (for the greatest variation among the counties)
    - High ACS rate: 59.4% in tract 940300 (no LF rate given)
    - Low ACS rate: 43.9% in tract 940400 (no LF rate given)

- There was a long form rate provided for only 2 of 9 tracts

II. Non-response Rate

A. Sample Unit Non-response Rate:

- Vilas County:
  - The overall county ACS rate was 5.48% compared to 18.38% for long form.
    - Best ACS Rate: 3.52% in tract 950100 (compared to 25.71% for LF for that tract)
    - Worst ACS Rate: 8.32% in tract 950300 (compared to 15.28% for LF for that tract)
    - Best LF Rate: 11.33% in tract 950500 (compared to 4.20% for ACS for that tract)
    - Worst LF Rate: 25.71% in tract 950100 (compared to 5.72% for ACS for that tract)
  - The rate for the ACS was lower than the Long Form in 5 of 5 tracts.
- Oneida County:
  - The overall county ACS rate was 3.91% compared to 19.3% for Long Form.
    - Best ACS Rate: 1.98% in tract 970900 (compared to 19.0% for LF for that tract)
    - Worst ACS Rate: 7.17% in tract 971300 (compared to 16.57% for LF for that tract)
    - Best LF Rate: 8.04% in tract 971400 (compared to 2.13% for ACS for that tract)
    - Worst LF Rate: 33.28% in tract 970600 (compared to 3.45% for ACS for that tract)
  - The rate for the ACS was lower than the long form in 11 of 11 tracts.
- Flathead County:
  - The overall county ACS rate was 3.79% compared to 3.75% for long form.
    - Best ACS Rate: 0.22% in tract 000700 (compared to 5.29% for LF for that tract)
    - Worst ACS Rate: 7.20% in tract 000200 (compared to 0.12% for LF for that tract)
    - Best LF Rate: 0.12% in tract 000200 (compared to 7.20% for ACS for that tract)
      - This merits further investigation.
    - Worst LF Rate: 8.14% in tract 000500 (compared to 4.18% for ACS for that tract)
  - Of the tracts that had rates for both ACS and Long Form, the rate was lower for ACS in 8 of 14
- Lake County:
  - The overall county ACS rate was 5.96% compared to 12.16% for Long Form.

        - Best ACS Rate: 1.31% in tract 940100 (compared to 8.82% for LF for that tract)
        - Worst ACS Rate: 8.56% in tract 000100 (compared to 7.43% for LF for that tract)
        - Best LF Rate: 6.38% in tract 940500 (compared to 6.33% for ACS for that tract)
        - Worst LF Rate: 34.12% in tract 940200 (compared to 4.64% for ACS for that tract)
    - The rate was lower for ACS in 8 of 9 tracts

B. Occupied Sample Unit Non-response Rate:

- Vilas County:
    - The overall county ACS rate was 10.73% compared to 14.18% for Long Form.
        - Best ACS Rate: 6.72% in tract 950500 (compared to 11.32% for LF for that tract)
        - Worst ACS Rate: 17.55% in tract 950100 (compared to 19.52% for LF for that tract)
        - Best LF Rate: 11.32% in tract 950500 (compared to 6.72% for ACS for that tract)
        - Worst LF Rate: 19.52% in tract 950100 (compared to 17.55% for ACS for that tract)
    - The rate for the ACS was lower than the Long Form in 5 of 5 tracts, but the overall Vilas County rate was the highest of the four counties.
- Oneida County:
    - The overall county ACS rate was 5.94% compared to 12.18% for Long Form.
        - Best ACS Rate: 2.24% in tract 971500 (compared to 6.92% for LF for that tract)
        - Worst ACS Rate: 12.43% in tract 971300 (compared to 12.95% for LF for that tract)
        - Best LF Rate: 5.19% in tract 971400 (compared to 2.31% for ACS for that tract)
        - Worst LF Rate: 16.90% in tract 970800 (compared to 5.0% for ACS for that tract)
    - The rate for the ACS was lower than the Long Form in 11 of 11 tracts.
- Flathead County:
    - The overall county ACS rate was 4.41% compared to 4.35% for Long Form.
        - Best ACS Rate: 0.23% in tract 000700 (compared to 6.76% for LF for that tract)
        - Worst ACS Rate: 8.31% in tract 000300 (compared to 6.00% for LF for that tract)
        - Best LF Rate: 0.53% in tract 000600 (compared to 3.81% for ACS for that tract)

        - Worst LF Rate: 10.56% in tract 000900 (compared to 1.35% for ACS for that tract)
    - The rate was lower for ACS in 7 of 14 tracts
- Lake County:
    - The overall county ACS rate was 7.70% compared to 9.24% for Long Form.
        - Best ACS Rate: 1.59% in tract 940100 (compared to 12.75% for LF for that tract)
        - Worst ACS Rate: 13.51% in tract 000100 (compared to 13.01% for LF for that tract)
        - Best LF Rate: 5.94% in tract 940500 (compared to 6.71% for ACS for that tract)
        - Worst LF Rate: 13.83% in tract 940200 (compared to 10.12% for ACS for that tract)
    - The rate was lower for ACS in 5 of 9 tracts

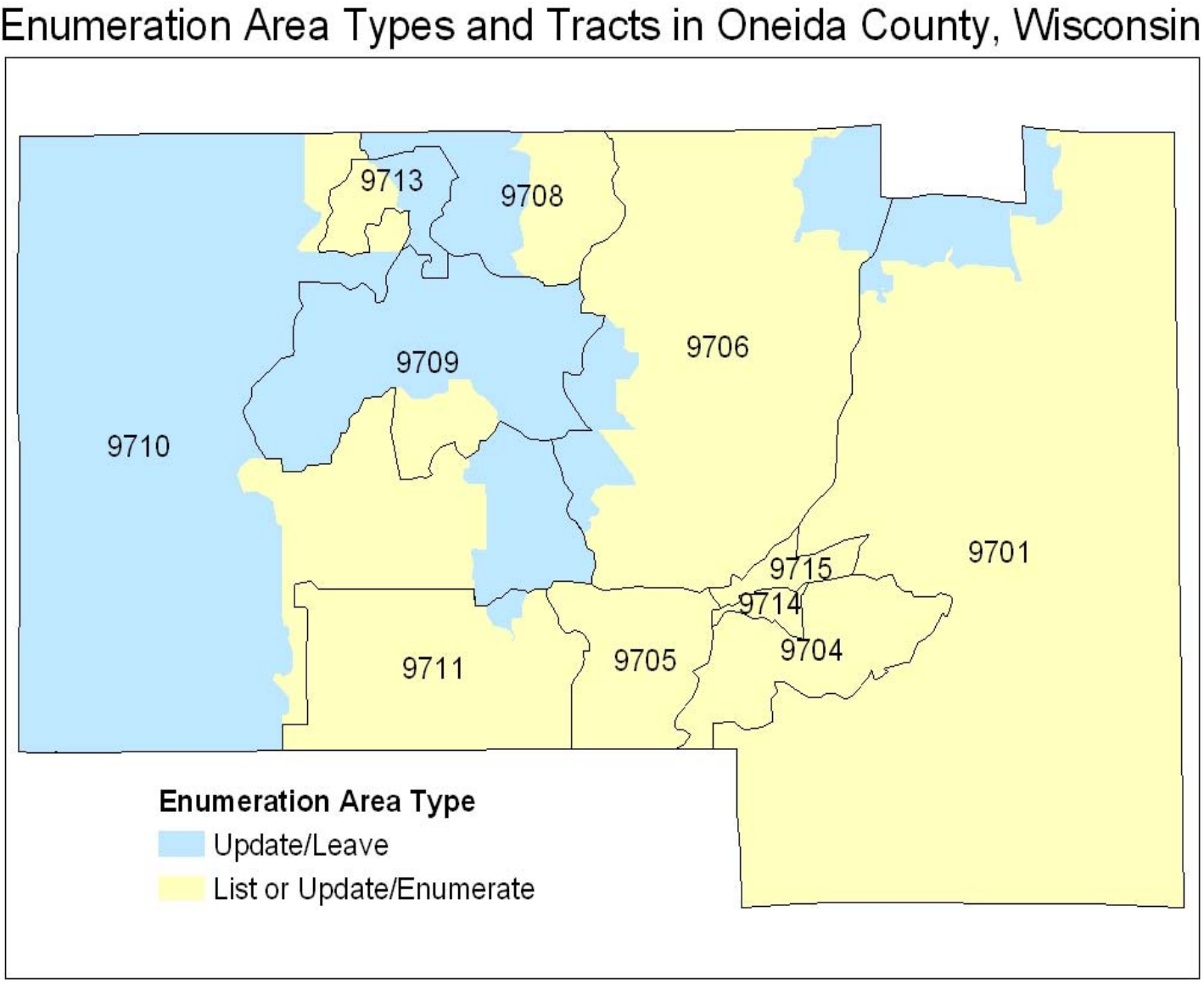
III. Completeness Ratio

- HOUSEHOLD POPULATION SAMPLE COMPLETENESS RATIO:
    - Vilas County:
        - The rate for ACS was 1.07 compared to 0.86 for LF
    - Oneida County:
        - The rate for ACS was 0.96 compared to 0.87 for LF
    - Flathead County:
        - The rate for ACS was 0.94 compared to 0.95 for LF
    - Lake County:
        - The rate for ACS was 0.87 compared to 0.89 for LF

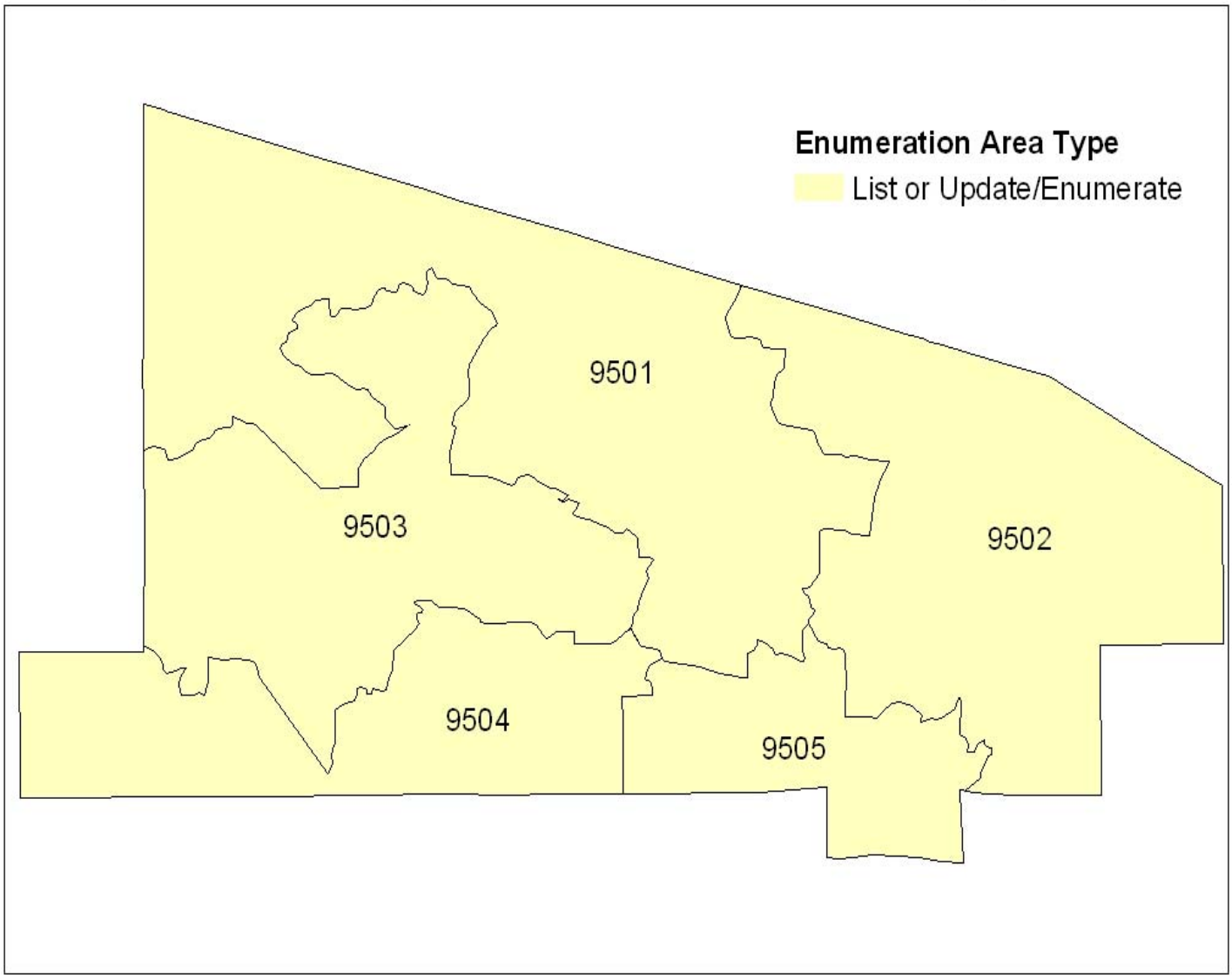
- HOUSING UNIT SAMPLE COMPLETENESS RATIO:
    - Vilas County:
        - The rate for ACS was 0.87 compared to 0.82 for LF
    - Oneida County:
        - The rate for ACS was 0.87 compared to 0.81 for LF
    - Flathead County:
        - The rate for ACS was 0.95 compared to 0.96 for LF
    - Lake County:
        - The rate for ACS was 0.89 compared to 0.88 for LF

Appendix C

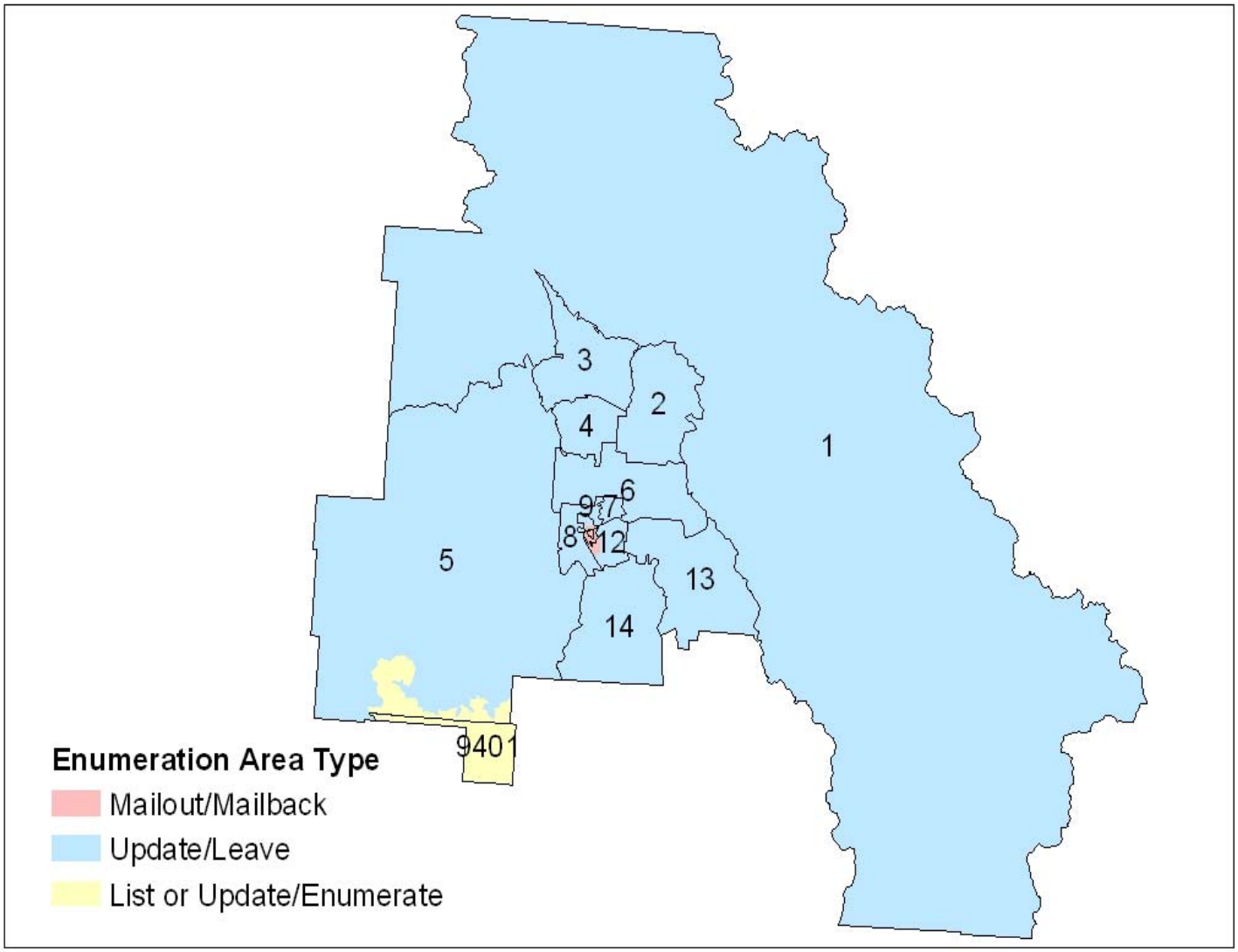
2000 Census Enumeration Maps



Enumeration Area Types and Tracts in Vilas County, Wisconsin



Enumeration Area Types and Tracts in Flathead County, Montana



Enumeration Area Types and Tracts in Lake County, Montana