

**Impacts of the 2005 Gulf Coast Hurricanes on Domestic Migration
The U.S. Census Bureau's Response**

Rodger V. Johnson, Supervisory Demographer
Justin M. Bland, Statistician-Demographer
Charles D. Coleman, Statistician-Demographer

Population Division
U.S. Census Bureau

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This report is released to inform interested parties of estimates research and to encourage discussion on this research. Any views expressed on statistical, methodological, technical, or operational issues are those of the authors and not necessarily those of the U.S. Census Bureau.

U S C E N S U S B U R E A U

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*Local Government Estimates and Migration Processing Branch
Population Division, U.S. Census Bureau*

Setting

In August and September of 2005, Hurricanes Katrina and Rita came onshore over the Louisiana and Mississippi gulf coast areas, directly impacting them and adjacent areas in Alabama and Texas. The images and reports of the broadcast media graphically depicted a major demographic event, with massive, sudden dislocations of population from areas either directly in the path of the hurricanes, or impacted by levee system failures in and around Orleans Parish (New Orleans).

Program Response to Gulf Coast Hurricanes

As the dimensions of this disaster became clear, the U.S. Census Bureau became increasingly concerned that the normal set of administrative records and processes would not fully support preparation of the annual population estimates.¹ In an effort to address this concern, the Census Bureau established an interdivisional working group. Under this mandate, the Census Bureau pursued three objectives:

- Defining the geographic extent of the disaster area
- Assessing the impact on administrative data
- Developing a contingency plan

Defining Geographic Extent of the Disaster Area

The first objective was to determine the geographic extent of the disaster area to be included in any special procedures the Census Bureau would ultimately develop. The U.S. Federal Emergency Management Agency (FEMA) settled this issue when it defined the disaster area to include the 117 parishes and counties shown in Figure 1 and posted on

¹ The July 1, 2007 Population Estimates time series reflects method revisions and updated component data in this paper. For additional information on the special methods used to produce the 2006 and 2007 estimates, please refer to, "Special Processing Procedures for the Areas Affected by Hurricanes Katrina and Rita: (Vintage 2007): April 1, 2000 to July 1, 2007," found on the Census Bureau's Web site, at <http://www.census.gov/popest/topics/methodology/2007-hurr-spcl-meth.html>

Table 1. The area defined by this list became the object on which subsequent activities were focused.

Assessing the Impact on Administrative Data

Household Population Under Age 65

Population Division staff assessed the probable impact on the Internal Revenue Service (IRS) data files. These files are the source of data for measuring domestic migration for the household population under the age of 65. Domestic migration is often the largest component of the cohort-component model, which incorporates births, deaths, and net migration (domestic and international) from the last decennial census of population to derive current population estimates.

In a normal year, in which no major area of the United States is impacted by a natural disaster of the size and scope discussed here, the domestic migration process utilizes the IRS Personal Income Tax Return data to develop migration rates from every county and statistical equivalent to every other county or statistical equivalent and from state to state nationwide.² The Population Division employs automated processes that compare the street address on each filer's tax return matched over two *successive* years (referred to as Year 1 and Year 2) to determine if the addresses are different, which are indicative of migration. (A geographic coding guide independent from the tax data is matched against the returns' addresses to assign them state and county codes, a process referred to as geocoding). If the street addresses of two matched returns differ and their state and/or county geocodes also have changed, the people listed on the return are declared to be *migrants*. People on matched returns whose addresses are the same or have unchanged state and county codes are declared to be *nonmigrants*. The migrant and nonmigrant exemptions are summed to form gross migration flows (ins and outs) for every county in the United States. Net migration rates for the household population under age 65 are computed from their gross migration flows and entered into a cohort-component model. The result is an estimate of net domestic migrants for the population under the age of 65 in every county in the United States.

The Census Bureau was concerned with how extensively IRS data coverage would suffer because of the impact of the hurricanes. In assessing the impact upon the IRS data, it was clear that the loss of life, housing, and employment, the attendant loss of financial records and the general overall disruption of day-to-day living of the people residing in the affected areas, were going to impair the reporting of tax returns for tax year 2005. In addition, the IRS granted relief to Federal Personal Income filers in the affected areas by announcing automatic filing extensions to October 15, 2006. Thus, one could expect that the number of returns would be down from the previous year, but the questions were, by how much and how would this situation affect coverage of the general population. Indications from a preliminary assessment of returns during the 2006 filing season for tax

² Statistical equivalents of counties include the parishes of Louisiana, independent cities, boroughs of Alaska and Alaska Census Areas. Hereinafter, we shall refer to any of these as a "county". The District of Columbia is treated as a statistical equivalent of a state.

year 2005 strongly indicated a reduction that would erode the Year 1 IRS record match rates that form a crucial measure of stability in the migration system.³ However, final assessment for each county would be based on statistical analysis developed as part of the contingency plan discussed in the section “Measuring Administrative Data Changes and Defining the Means to Trigger the Contingency Plan” below.

Household Population Aged 65 and Older

We also assessed the currency and coverage of Medicare enrollment data that are used to compute domestic migration for people 65 and older, with a specific focus on how much of the demographic changes resulting from the hurricanes would go unmeasured in the enrollment data. In a normal year, migration of the population aged 65 and older is measured using aggregate Medicare data provided by the Centers for Medicare and Medicaid Services (CMS). The Population Division receives data from CMS every year with a one-year lag. Therefore, the data used in the 2006 estimates actually represent Medicare enrollments as of July 1, 2005. We calculate the numeric change between the last two years of CMS data (July 1, 2004 and July 1, 2005) and add this change to the last year of CMS data (July 1, 2005) to estimate Medicare enrollment as of July 1, 2006. Given the timing of the hurricanes it seemed certain that the Medicare data would not provide any means of reliably measuring domestic migration of this age group in the disaster area.

Developing a Contingency Plan

Census Bureau staff met weekly over an extended period to develop a contingency plan. The plan had to include a means to:

- Acquire and assess the potential for administrative data to supplement and/or model the missing administrative data.
- Define a means to measure the deficiencies in the administrative data that, if present, would trigger use of supplemental data.

Acquiring and Assessing Administrative Data Files

The Census Bureau identified and acquired supplemental data files from the U.S. Postal Service (USPS) and FEMA, as both files potentially could measure where people had moved from the areas impacted by the hurricanes. If a method could be devised to match these files to the IRS data files they could serve to provide address information for filers who did not file tax year 2005 returns in 2006 due to the hurricanes. The USPS’s National Change of Address (NCOA) file and the FEMA applicant file were both good candidates for this purpose. The basic idea was that a tax filer in the disaster areas who did not file a return would be likely to file a change of address notice with USPS or be listed in the FEMA applicant file with a current address. The Census Bureau set out to

³ The Year 1 IRS record match rate for a county is 100% * (Filer records coded to the county in Year 1 who file returns in both Years 1 and 2) / (Filer records coded to the county in Year 1).

test these assumptions and to develop a workable solution. The data sources had to meet one critical element: they could be combined with the IRS tax data to more fully measure migration for the entire migration year, July 1, 2005 to June 30, 2006.

However, before any special administrative record matching tests could be performed, the Census Bureau had to secure agreement from the IRS to allow matching of their tax data files with these alternative administrative data sources. This approval was secured through the joint efforts of the staff of the Census Bureau and their counterparts at the IRS and the USPS. Once approval was secured, staff worked to test these files and to assess the results. The FEMA file was considered carefully but ultimately not used because it was deemed to lack currency for the intended purpose. The great majority of the applicant file records were clustered in the first three months of the migration period, rather than forming a distribution spread over the whole period of migration, from August 2005 to July 2006. However, work with the USPS NCOA file was more positive: it was found to be useful because of its extensive and timely coverage of movers and it also could be closely matched to the IRS data. The next section details the process used to trigger the contingency plan to use NCOA data in combination with IRS data and to model Medicare enrollment data.

Measuring Administrative Data Changes and Defining the Means to Trigger the Contingency Plan

The objective of this task was to identify counties that would benefit most by applying supplemental address data from NCOA to the matching process. The task required developing a set of baseline IRS match rate targets using statistical modeling. When the 2005-2006 county-level match rate fell below its trigger threshold, the NCOA data would be used to supplement the IRS data. The Census Bureau calculated Year 1 and Year 2 IRS data match rates for each pair of successive tax years as far back as 1999. For each county, a backward stepwise regression of the match rate against an intercept and time trend was run. If the time trend was not significant at the 5 percent level, it was removed from the model. In this instance, the match rate was effectively modeled as a constant equal to the average of the preceding six match rates. The models were then used to predict a match rate for 2005-2006, by either extending the time trend or using the average match rate, as appropriate. Confidence intervals of 95 percent were placed around the predicted match rate by multiplying the standard error of the regression or standard deviation of the match rates by the appropriate value from the *t*-distribution. The lower bound of this confidence interval became the threshold 2005-2006 match rate, below which the contingency was activated.

Figures 2 and 3 contrast the match rates for calendar years 2004-2005 and 2005-2006, respectively, of counties in the impacted area. The general decline in match rates between the two years is striking. In 2006, particularly low match rates were observed in the vicinities of the two hurricanes' landfalls. The first area is associated with Hurricane Katrina in the New Orleans area and areas to the east and northeast, most notably Orleans and St. Bernard parishes in Louisiana, but also to the immediately adjacent parishes of Jefferson, Plaquemines, St. John the Baptist, and St. Tammany parishes, as well as the

coastal counties of Hancock, Harrison, and Jackson in Mississippi. Hurricane Rita's impact was focused in southwestern Louisiana and southeastern Texas, especially Cameron Parish, Louisiana.

Impact of the Contingency Plan

The contingency plan was ultimately triggered for 62 counties that did not meet the threshold IRS 2005 (Year 1) to 2006 (Year 2) match rate. These counties are identified on Table 1, with a "1" in column 8, labeled "Without NCOA," and mapped on Figure 4. The match rates for virtually all of the 62 counties increased by including the NCOA data to replace the missing IRS return data. The average overall match rate gain was 2.3 percentage points. The counties most impacted by the hurricanes generally had the lowest match rates; the NCOA data had the greatest benefit precisely for those counties with the lowest match rates. For example, St. Bernard Parish had the largest match rate gain of all, picking up over 20 percentage points, followed by Orleans Parish, with a percentage point gain of 10.2, and Hancock County, Mississippi, with 8.2 percentage points. This is depicted on Figure 5. The gains in match rates were substantial overall, with 38 counties actually meeting the original match rate thresholds after the NCOA address supplements were included. The remainder of the counties averaged higher overall average match gains, at 3.7 percentage points.

Key Features of the Contingency Plan

The NCOA record universe eligible for migration use represented all possible movers who filed a change of address during the period following the arrival of the hurricanes and the date of the estimates (July 1, 2006). We restricted the pool of NCOA records to those that we had been able to match to Year 1 IRS records (filed in calendar 2005) that also were located in the 62 counties. The Year 2 NCOA address records were selected to supplement for any missing Year 2 IRS returns that had not been filed by April 15, 2006.

During annual processing, the internal migration program matches Year 1 IRS records to Year 2 IRS records to create the match pool of records to compute migration. The matched returns are classified into immigrants, outmigrants, and nonmigrants, depending upon whether or not the people moved from one county to another between the first and second year. Each gross migration flow is the sum of the corresponding Year 2 exemptions. The Year 1 and Year 2 nonmatches are discarded from further processing.

Each county's net migration rate is calculated as:

$$\frac{\text{immigrants} - \text{outmigrants}}{\text{nonmigrants} + \text{outmigrants}}$$

However, in order to incorporate NCOA records into the Year 2 part of the program, we modified it to allow for a secondary match of any remaining unmatched Year 1 IRS records, using the eligible NCOA address records in the second year. This secondary processing step enabled us to match up families or individuals who had not filed an IRS

return in 2006, yet who had filed a change-of-address form as late as June 30, 2006. This step increased the number of exemptions used in the final migration computations. One other change we made to our standard process to accommodate the IRS/NCOA subset of matched records is that we summed exemptions from 2005 to compute gross migration flows because of the lack of comparable data for 2006 on the NCOA records.

We determined that the Medicare enrollment data would show no change whatsoever, because the existing estimation process always used data projected from the previous year. This meant that, in the impacted areas, Medicare data would completely omit the effects of the hurricanes. The Centers for Medicare and Medicaid services, the supplier of the enrollment data we use in calculating domestic migration for people age 65 and older, had no additional data available to aid in recalculating migration rates for this age group. Therefore we decided to model the out-migration flows of the 62 counties based upon tax return data specially prepared for the 65 and older population as the best measure of change for this age group.

Ultimately, IRS and Medicare data were merged to form estimates of migration for the household population; to this were added group quarters population data and a modified data file for births and deaths to create the final population estimates.

Findings: Some Highlights

Net Migration Rates

Net migration rates for estimates year 2005-2006 are shown on the map (Figure 6). St. Bernard Parish and Orleans Parish were the two most demographically impacted parishes within the disaster area. Their net migration rates between July 1, 2005 and July 1, 2006 exceeded -50 percent. Plaquemines and Cameron parishes and the Mississippi counties of Hancock and Harrison had the next highest set of net negative migration rates. Parishes and counties in Texas adjacent to Cameron also sustained negative net migration from the dislocations caused by Hurricane Rita. In contrast, positive net migration rates were recorded for parishes and counties further inland or nestled between the paths of the hurricanes. The parishes of Ascension, Tangipahoa, and Pearl River County, Mississippi, had the highest net migration rates, ranging between 5.1 and 10 percent.

Percent Population Change

Changes in the estimated population for all counties within the disaster area between 2005 and 2006 are mapped on Figure 7. St. Bernard Parish experienced the highest percent population loss of any parish or county within the disaster area, with a population decline exceeding 78 percent. St. Bernard parish was followed by Orleans, Plaquemines, and Cameron Parishes and by the coastal counties of Hancock and Harrison in Mississippi. In terms of absolute numbers, Orleans Parish by far decreased the most, with a population decline estimated at more than 243,000.⁴ These decreases contrast with

⁴ U.S. Census Bureau: <http://www.census.gov/popest/counties/tables/CO-EST2007-01-22.xls>

the population gains inland to the west and north in Louisiana and Mississippi, in western Alabama, and in parts of eastern Texas, including Harris County.

Migrant Flows from the New Orleans-Metairie-Kenner, LA Metropolitan Statistical Area

Migrants⁵ left the New Orleans metropolitan statistical area to destinations around the country. Many large metropolitan areas, especially those in the South, experienced a large increase of in-migrants from parishes in the metropolitan area. The maps shown on Figures 8, 9, and 10, highlight the destination counties of migrants from Orleans, Jefferson, and St. Bernard Parishes, respectively, and provide an idea of the geographic extent of migration from each.

The final series of maps displays the destinations of the migrants out of the entire New Orleans-Metairie-Kenner, LA Metropolitan Statistical Area, which includes the three above-mentioned parishes along with Plaquemines, St. Charles, St. John the Baptist, and St. Tammany Parishes (Figures 11-14). The destination counties and parishes as well as the number of migrants arriving are identified. Each of the four maps focuses on an area that absorbed some of the largest numbers of migrants and is shown at a larger scale for more detail. The counties and parishes within the boundaries of the Atlanta, Houston, Dallas-Fort Worth, New Orleans, and Baton Rouge metropolitan areas are highlighted in these close-up views. The migrants arrived not only in the principal cities in these metropolitan areas, but also the suburban areas and surrounding counties of these cities. For example, in the Atlanta area (Figure 11), DeKalb and Fulton counties, which contain the city proper of Atlanta, received the largest numbers of migrants, but 12 other counties in the metropolitan area also had a substantial number of migrants arrive from the New Orleans area. Similar resettlement migrant patterns are displayed in the Houston and Dallas-Ft. Worth metropolitan areas with the outlying metropolitan counties receiving fewer but nontrivial numbers.

Figure 14 focuses on destinations in Louisiana. While this map displays the migrants who left the New Orleans metropolitan area to go to the Baton Rouge metropolitan area and surrounding parishes, it also includes migrants who moved from one parish to another within the New Orleans metropolitan area. For example, the symbol placed over St. Tammany Parish on the map represents the sum of migrants from Orleans, St. Bernard, Jefferson, St. Charles, St. John the Baptist, and Plaquemines Parishes who moved to St. Tammany Parish. People leaving their homes in the New Orleans metropolitan area arrived all over the southern half of Louisiana, with a concentration around East Baton Rouge Parish and the parishes north and west of Orleans. A sizeable number of people arrived in Orleans Parish from elsewhere in the New Orleans metropolitan area, presumably to take part in the rebuilding effort.

⁵ Migrants here are defined as the number of the under age 65 tax exemptions.

Conclusion

The demographic dislocations caused by Hurricanes Katrina and Rita in 2005 posed a challenge to the U.S. Census Bureau to produce representative post-hurricane estimates in the affected counties within the required schedule. The two main data sources, IRS personal income tax return data and Medicare enrollments, were either incomplete or unusable. The Census Bureau alleviated this problem by supplementing these datasets with USPS change-of-address information and by modeling migration for the 65 and older population. In so doing, the Census Bureau produced population estimates that accounted for the impacts of the hurricanes. The most notable changes noted between July 1, 2005 and July 1, 2006 were the drastic population declines among counties along the path of the hurricanes, lesser declines in less affected counties and increases in mildly affected counties. Population also flowed to counties outside the disaster area, mainly in the metropolitan South.

The USPS address data also enabled the U.S. Census Bureau to maintain a population migration base from which to measure domestic migration for subsequent population estimates time series. As the recently released vintage July 1, 2007 population estimates show, many affected areas have substantial population increases from July 2006 to July 2007. Later population estimates releases will track ongoing demographic change in the disaster area.

Table 1 - List of the Original FEMA Counties and Parishes with the 62 NCOA Supplemented Counties Identified

State	County name	2005-2006 IRS Match Rate							Threshold Match Rate Status	
		Predicted	Threshold	Actual				NCOA Gain	1 = below threshold 0 = above threshold	
				Rate	Threshold Diff	Rate	Threshold Diff		Without NCOA	With NCOA
(1)	(2)	(3)	(4)=(3)-(2)	(5)	(6)=(5)-(2)	(7)=(5)-(3)	(8)	(9)		
Alabama	Baldwin County	88.1	87.3	86.0	-1.3	87.6	0.3	1.5	1	0
	Choctaw County	89.7	88.8	89.0	0.3	89.1	0.3	0.1	0	0
	Clarke County	90.2	89.1	90.5	1.4	90.6	1.5	0.1	0	0
	Greene County	88.7	87.5	89.0	1.5	89.0	1.5	0.0	0	0
	Hale County	89.2	87.7	90.0	2.3	90.1	2.4	0.1	0	0
	Marengo County	90.2	89.5	89.3	-0.2	90.0	0.5	0.7	1	0
	Mobile County	88.9	87.9	87.2	-0.7	88.8	0.9	1.6	1	0
	Pickens County	90.1	88.4	90.3	1.9	90.3	1.9	0.0	0	0
	Sumter County	89.0	87.3	89.0	1.6	89.2	1.8	0.2	0	0
	Tuscaloosa County	89.6	89.2	89.4	0.2	89.4	0.3	0.0	0	0
	Washington County	89.1	88.1	89.0	1.0	89.2	1.1	0.2	0	0
Louisiana	Acadia Parish	90.6	89.9	89.4	-0.5	90.2	0.3	0.8	1	0
	Allen Parish	89.2	88.4	88.8	0.3	88.9	0.5	0.1	0	0
	Ascension Parish	90.1	89.8	88.8	-0.9	90.0	0.3	1.2	1	0
	Assumption Parish	90.4	89.9	89.9	0.0	90.8	0.9	0.8	1	0
	Beauregard Parish	89.5	88.8	88.1	-0.7	89.3	0.5	1.2	1	0
	Calcasieu Parish	89.2	88.8	85.9	-2.9	87.7	-1.1	1.8	1	1
	Cameron Parish	90.7	89.8	79.2	-10.6	83.6	-6.2	4.4	1	1
	East Baton Rouge Parish	89.0	88.5	87.7	-0.8	89.2	0.7	1.5	1	0
	East Feliciana Parish	89.9	89.0	88.9	-0.2	89.6	0.6	0.8	1	0
	Evangeline Parish	89.9	88.5	89.1	0.6	89.2	0.7	0.1	0	0
	Iberia Parish	90.3	89.8	88.8	-1.0	89.7	0.0	1.0	1	1
	Iberville Parish	88.9	88.8	88.4	-0.4	89.4	0.6	1.0	1	0
	Jefferson Parish	89.1	88.6	74.1	-14.5	80.3	-8.3	6.2	1	1
	Jefferson Davis Parish	89.6	88.8	88.9	0.1	89.2	0.4	0.3	0	0
	Lafayette Parish	89.7	89.5	88.6	-0.9	89.9	0.4	1.2	1	0
	Lafourche Parish	90.7	90.2	89.4	-0.8	90.3	0.1	0.9	1	0
	Livingston Parish	89.4	88.9	88.2	-0.7	89.5	0.6	1.3	1	0
	Orleans Parish	87.2	86.4	69.7	-16.6	79.9	-6.5	10.2	1	1
	Plaquemines Parish	89.1	88.6	76.2	-12.5	83.1	-5.6	6.9	1	1
	Pointe Coupee Parish	90.1	88.9	89.0	0.1	89.3	0.3	0.3	0	0
	Sabine Parish	89.8	88.8	88.7	-0.1	89.6	0.8	1.0	1	0
	St. Bernard Parish	89.6	89.1	65.5	-23.6	85.9	-3.2	20.4	1	1
	St. Charles Parish	90.6	89.7	81.7	-8.0	83.5	-6.2	1.8	1	1
	St. Helena Parish	88.9	87.9	86.4	-1.5	87.1	-0.8	0.7	1	1
	St. James Parish	90.3	89.4	88.4	-0.9	89.2	-0.2	0.7	1	1
	St. John The Baptist Parish	89.9	89.2	86.3	-2.8	87.7	-1.5	1.4	1	1
	St. Landry Parish	89.3	88.7	89.4	0.7	89.6	0.9	0.2	0	0
	St. Martin Parish	90.6	89.5	89.7	0.1	89.9	0.3	0.2	0	0
	St. Mary Parish	89.6	88.7	88.8	0.1	89.0	0.2	0.1	0	0
	St. Tammany Parish	89.6	88.3	72.1	-16.1	77.2	-11.1	5.1	1	1
	Tangipahoa Parish	87.9	87.0	85.5	-1.6	86.9	-0.1	1.4	1	1
	Terrebonne Parish	90.4	89.7	88.9	-0.7	90.2	0.5	1.3	1	0
	Vermilion Parish	90.6	89.9	88.9	-1.0	90.2	0.3	1.3	1	0
	Vernon Parish	90.3	88.3	89.2	0.9	89.4	1.0	0.2	0	0
	Washington Parish	87.7	87.3	83.5	-3.8	85.2	-2.0	1.7	1	1
	West Baton Rouge Parish	90.4	89.8	89.4	-0.4	90.3	0.4	0.8	1	0
	West Feliciana Parish	89.5	88.4	87.8	-0.6	88.8	0.4	1.0	1	0
Mississippi	Adams County	88.5	87.6	87.5	-0.1	88.5	0.9	1.0	1	0
	Amite County	89.6	87.7	88.5	0.8	88.6	1.0	0.1	0	0
	Attala County	89.2	87.7	89.6	2.0	89.7	2.1	0.1	0	0
	Choctaw County	89.6	86.8	89.7	2.9	89.7	2.9	0.0	0	0
	Claiborne County	88.2	86.5	88.1	1.6	88.2	1.7	0.1	0	0

Table 1 (cont.)

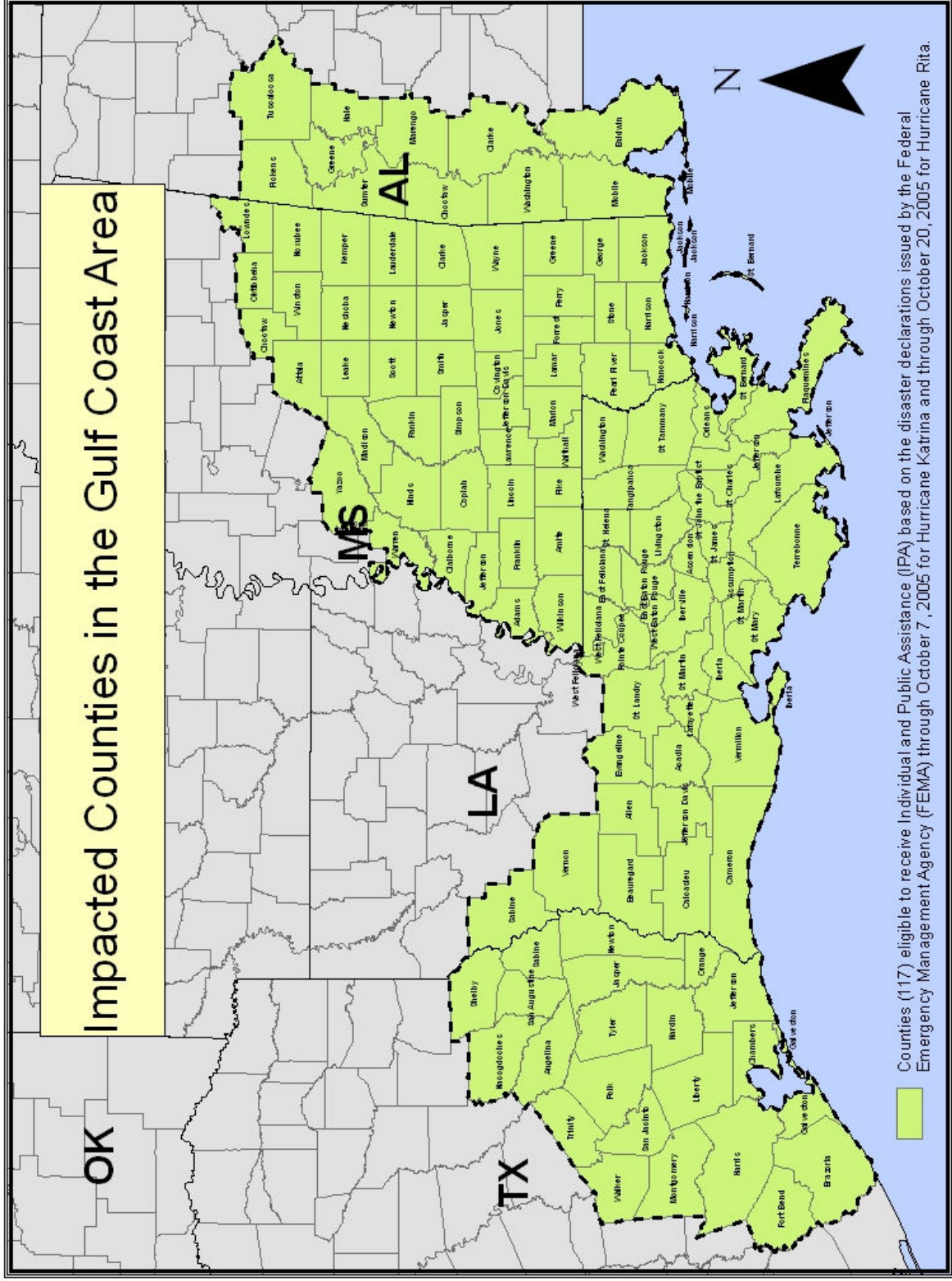
State	County name	2005-2006 IRS Match Rate							Below Threshold Match Rate	
		Predicted	Threshold	Actual				NCOA Gain	Without NCOA	With NCOA
				Without NCOA Rate	Threshold Diff	With NCOA Rate	Threshold Diff			
(1)	(2)	(3)	(4) =(3)-(2)	(5)	(6)=(5)-(2)	(7)=(5)-(3)	(8)	(9)		
Mississippi	Clarke County	89.1	88.0	88.3	0.3	88.6	0.6	0.3	0	0
	Copiah County	89.4	88.7	88.5	-0.2	89.3	0.7	0.8	1	0
	Covington County	89.1	88.1	85.6	-2.5	86.5	-1.6	0.9	1	1
	Forrest County	88.3	88.0	85.6	-2.4	87.5	-0.5	1.9	1	1
	Franklin County	89.6	87.8	88.1	0.3	88.3	0.4	0.2	0	0
	George County	89.2	88.1	87.3	-0.8	88.6	0.5	1.2	1	0
	Greene County	89.4	87.7	88.7	1.0	89.1	1.4	0.4	0	0
	Hancock County	88.6	87.7	72.5	-15.2	80.7	-7.0	8.2	1	1
	Harrison County	88.5	87.9	79.2	-8.7	83.4	-4.5	4.2	1	1
	Hinds County	89.2	88.5	88.6	0.1	88.9	0.4	0.3	0	0
	Jackson County	89.1	88.3	79.4	-8.9	82.8	-5.5	3.3	1	1
	Jasper County	87.8	86.3	87.1	0.7	87.3	1.0	0.2	0	0
	Jefferson County	87.9	85.8	88.2	2.4	88.4	2.6	0.1	0	0
	Jefferson Davis County	87.4	85.9	85.8	-0.1	86.5	0.6	0.7	1	0
	Jones County	89.5	87.7	87.1	-0.6	88.1	0.4	1.0	1	0
	Kemper County	90.2	89.5	90.7	1.1	90.8	1.3	0.2	0	0
	Lamar County	89.7	89.3	86.0	-3.3	87.8	-1.6	1.7	1	1
	Lauderdale County	90.4	89.6	88.5	-1.1	89.6	0.0	1.1	1	1
	Lawrence County	89.3	87.4	88.1	0.7	88.4	1.0	0.2	0	0
	Leake County	89.3	88.4	88.3	-0.1	88.9	0.5	0.6	1	0
	Lincoln County	89.8	88.9	89.1	0.2	89.3	0.4	0.2	0	0
	Lowndes County	90.1	88.5	89.9	1.3	89.9	1.4	0.0	0	0
	Madison County	90.1	89.2	88.7	-0.5	89.7	0.4	0.9	1	0
	Marion County	88.2	87.7	86.6	-1.2	87.8	0.0	1.2	1	0
	Neshoba County	87.9	87.0	87.4	0.4	87.6	0.6	0.2	0	0
	Newton County	90.1	89.2	88.9	-0.3	89.5	0.3	0.6	1	0
	Noxubee County	89.3	88.0	88.7	0.7	88.9	0.9	0.1	0	0
	Oktibbeha County	89.0	87.6	89.4	1.9	89.6	2.0	0.1	0	0
	Pearl River County	88.4	87.7	82.9	-4.9	84.9	-2.8	2.0	1	1
	Perry County	89.4	87.9	87.3	-0.7	88.3	0.4	1.0	1	0
	Pike County	88.5	87.3	88.1	0.8	88.3	1.0	0.2	0	0
	Rankin County	90.3	89.5	88.8	-0.7	90.1	0.5	1.2	1	0
	Scott County	89.3	88.2	88.8	0.6	89.0	0.8	0.2	0	0
	Simpson County	88.7	87.2	87.9	0.6	88.0	0.8	0.2	0	0
	Smith County	90.0	88.7	88.4	-0.3	88.8	0.2	0.5	1	0
	Stone County	88.8	86.7	84.5	-2.2	86.0	-0.7	1.5	1	1
	Walthall County	89.0	87.4	87.7	0.3	87.9	0.5	0.2	0	0
	Warren County	89.9	89.0	89.6	0.6	89.7	0.6	0.1	0	0
	Wayne County	89.7	88.5	88.4	-0.1	89.2	0.8	0.8	1	0
	Wilkinson County	88.6	87.3	88.6	1.3	88.8	1.5	0.2	0	0
	Winston County	88.9	87.6	89.5	1.9	89.6	2.0	0.1	0	0
	Yazoo County	88.4	87.1	88.4	1.3	88.5	1.4	0.1	0	0
Texas	Angelina County	89.8	88.6	88.9	0.3	88.9	0.4	0.0	0	0
	Brazoria County	89.3	88.8	88.9	0.0	88.9	0.1	0.1	0	0
	Chambers County	88.9	88.1	88.3	0.2	88.3	0.3	0.1	0	0
	Fort Bend County	89.3	88.3	88.6	0.3	88.6	0.3	0.0	0	0
	Galveston County	88.6	88.4	88.1	-0.3	89.3	0.9	1.2	1	0
	Hardin County	90.0	89.2	87.9	-1.2	89.1	0.0	1.2	1	1
	Harris County	88.2	87.7	88.0	0.3	88.0	0.3	0.1	0	0
	Jasper County	88.8	87.8	86.9	-0.8	88.0	0.2	1.0	1	0
	Jefferson County	88.9	88.4	87.7	-0.7	89.2	0.8	1.5	1	0
	Liberty County	87.8	87.2	87.5	0.3	87.6	0.4	0.1	0	0
	Montgomery County	88.5	87.7	87.7	0.1	87.8	0.1	0.0	0	0
	Nacogdoches County	88.4	87.3	88.2	0.9	88.2	0.9	0.0	0	0
	Newton County	88.1	87.5	87.0	-0.5	87.9	0.4	0.9	1	0
	Orange County	88.9	88.4	87.5	-1.0	89.0	0.6	1.5	1	0

Table 1 (cont.)

		2005-2006 IRS Match Rate							Below Threshold Match Rate	
				Actual						
State	County name	Predicted	Threshold	Without NCOA		With NCOA		NCOA Gain	Without NCOA	With NCOA
				Rate	Threshold Diff	Rate	Threshold Diff			
		(1)	(2)	(3)	(4) =(3)-(2)	(5)	(6)=(5)-(2)	(7)=(5)-(3)	(8)	(9)
Texas										
	Polk County	89.9	89.6	89.4	-0.2	90.0	0.4	0.7	1	0
	Sabine County	89.1	87.3	88.3	1.0	88.6	1.3	0.3	0	0
	San Augustine County	89.0	88.3	87.5	-0.8	88.3	0.0	0.9	1	0
	San Jacinto County	86.9	85.6	86.9	1.3	87.1	1.4	0.1	0	0
	Shelby County	88.3	87.4	88.3	1.0	88.4	1.0	0.0	0	0
	Trinity County	87.4	86.6	86.9	0.3	86.9	0.3	0.0	0	0
	Tyler County	87.8	87.0	87.4	0.4	87.6	0.6	0.2	0	0
	Walker County	88.9	88.3	89.0	0.6	89.0	0.6	0.0	0	0

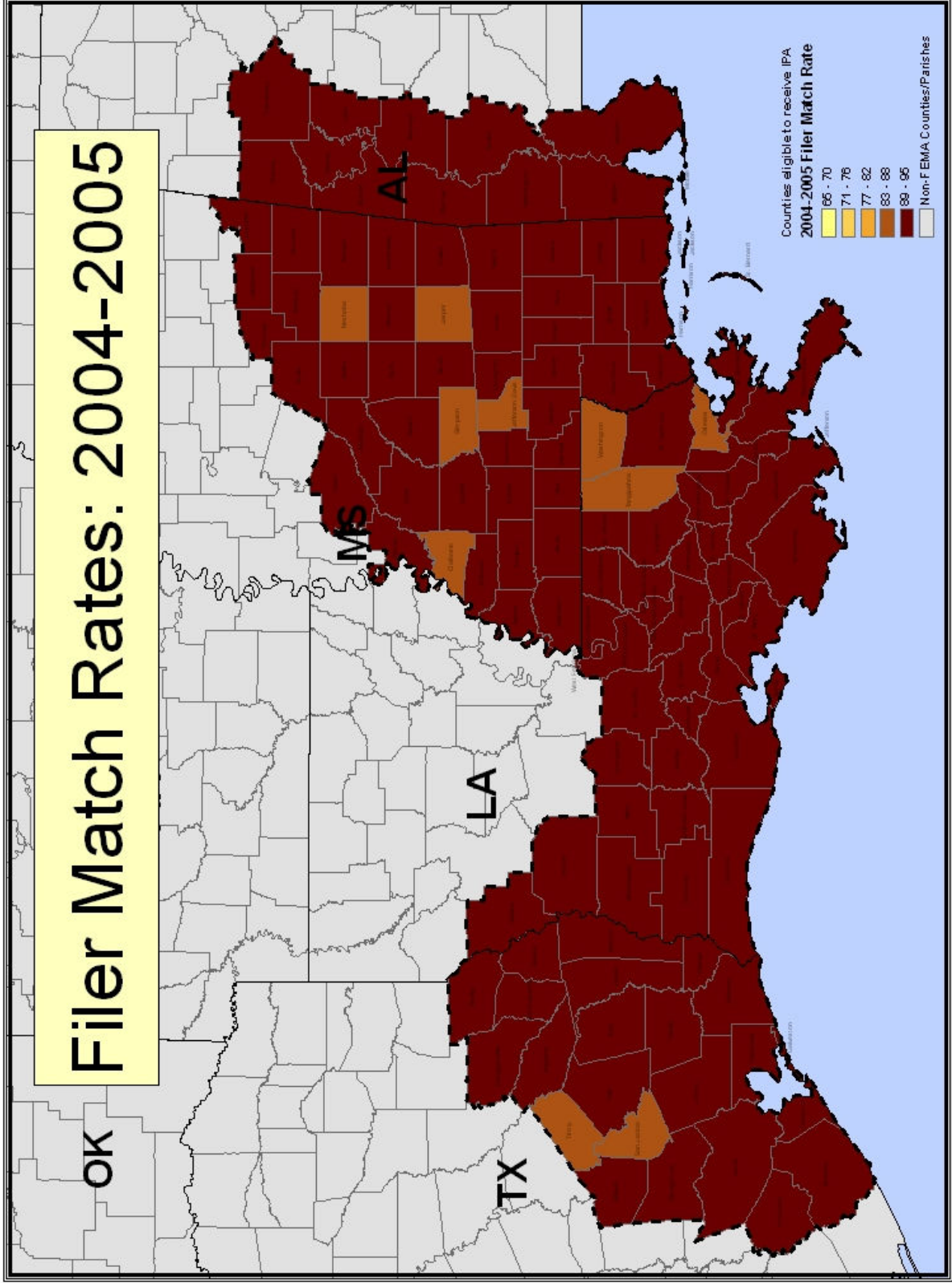
Source: U.S. Census Bureau

Figure 1: Impacted Counties in the Gulf Coast Area



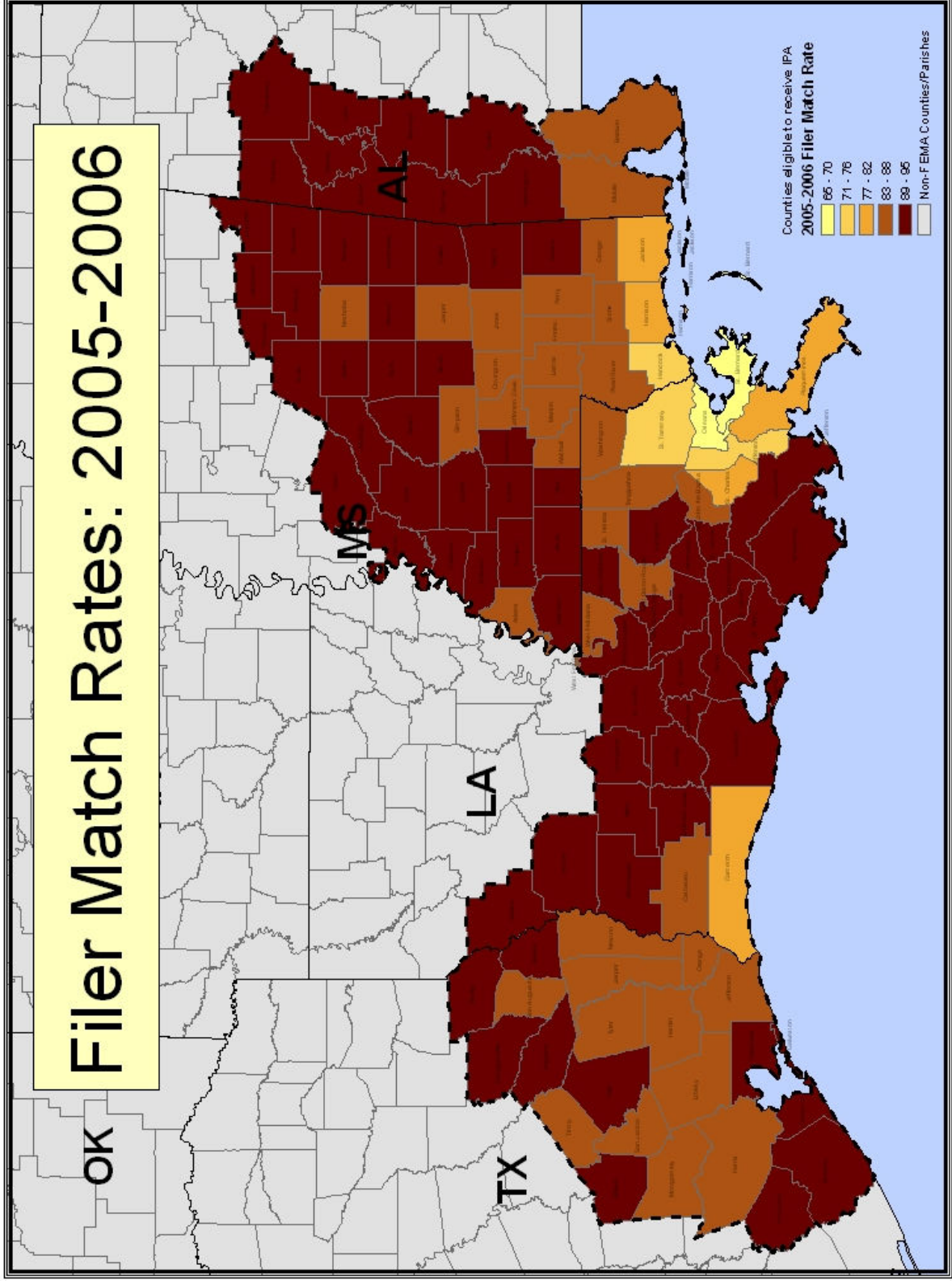
Source: Federal Emergency Management Agency

Figure 2: IRS Filer Match Rates in Migration Year: 2004-2005



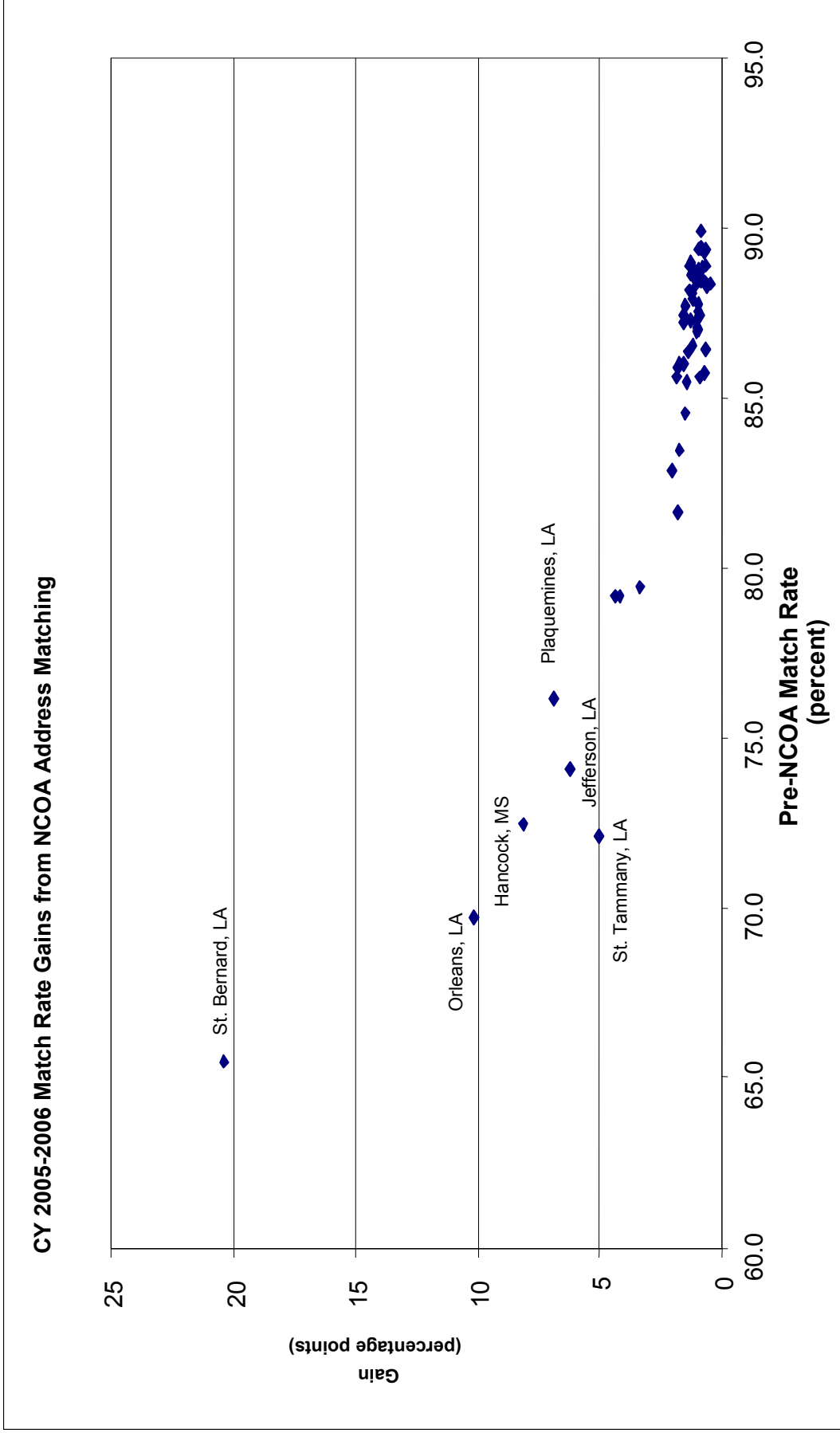
Source: U.S. Census Bureau

Figure 3: IRS Filer Match Rates in Migration Year 2005-2006



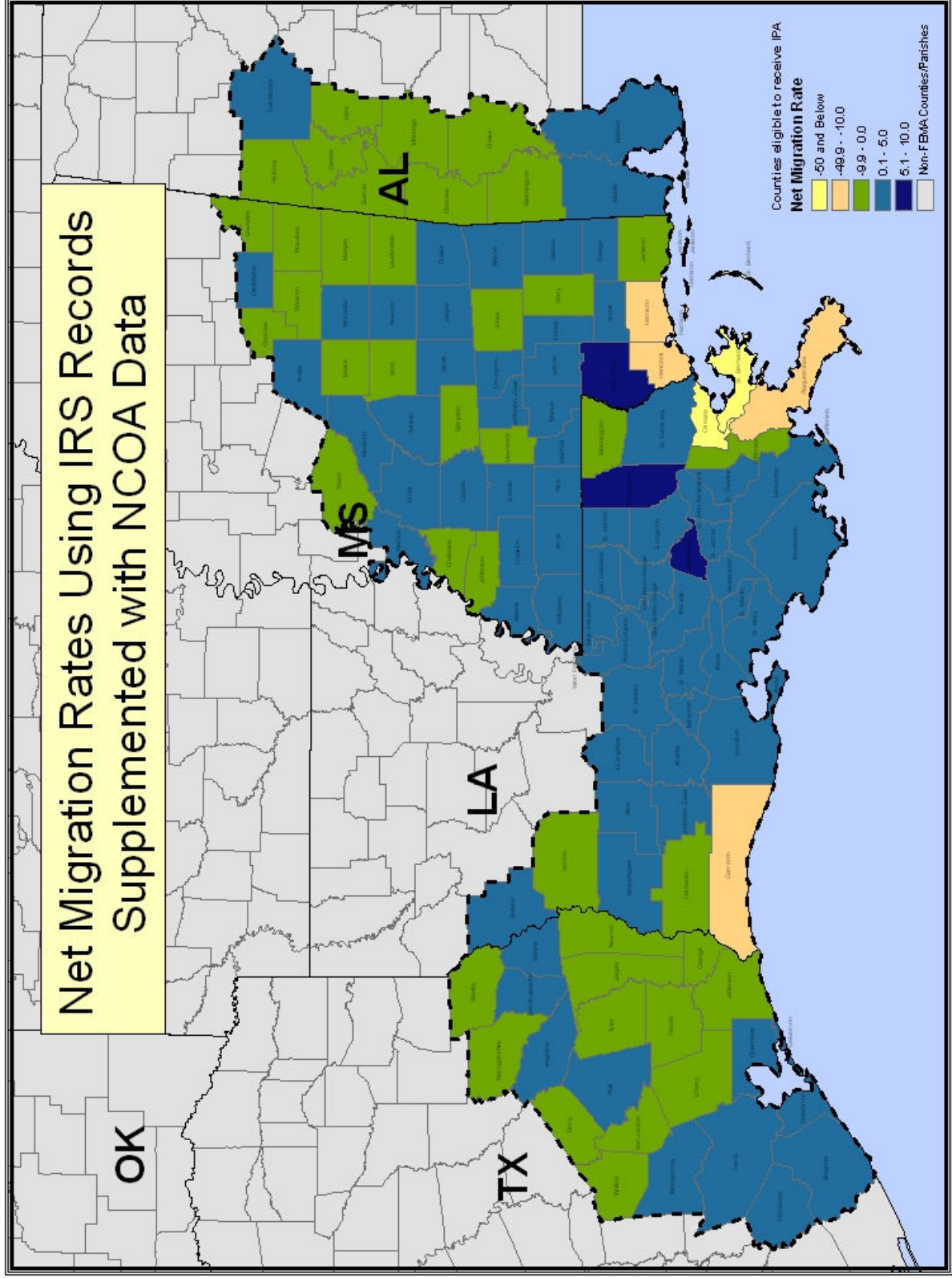
Source: Table 1, column 3

Figure 5: Migration Year 2005-2006 Match Rate Gains from NCOA Address Matching



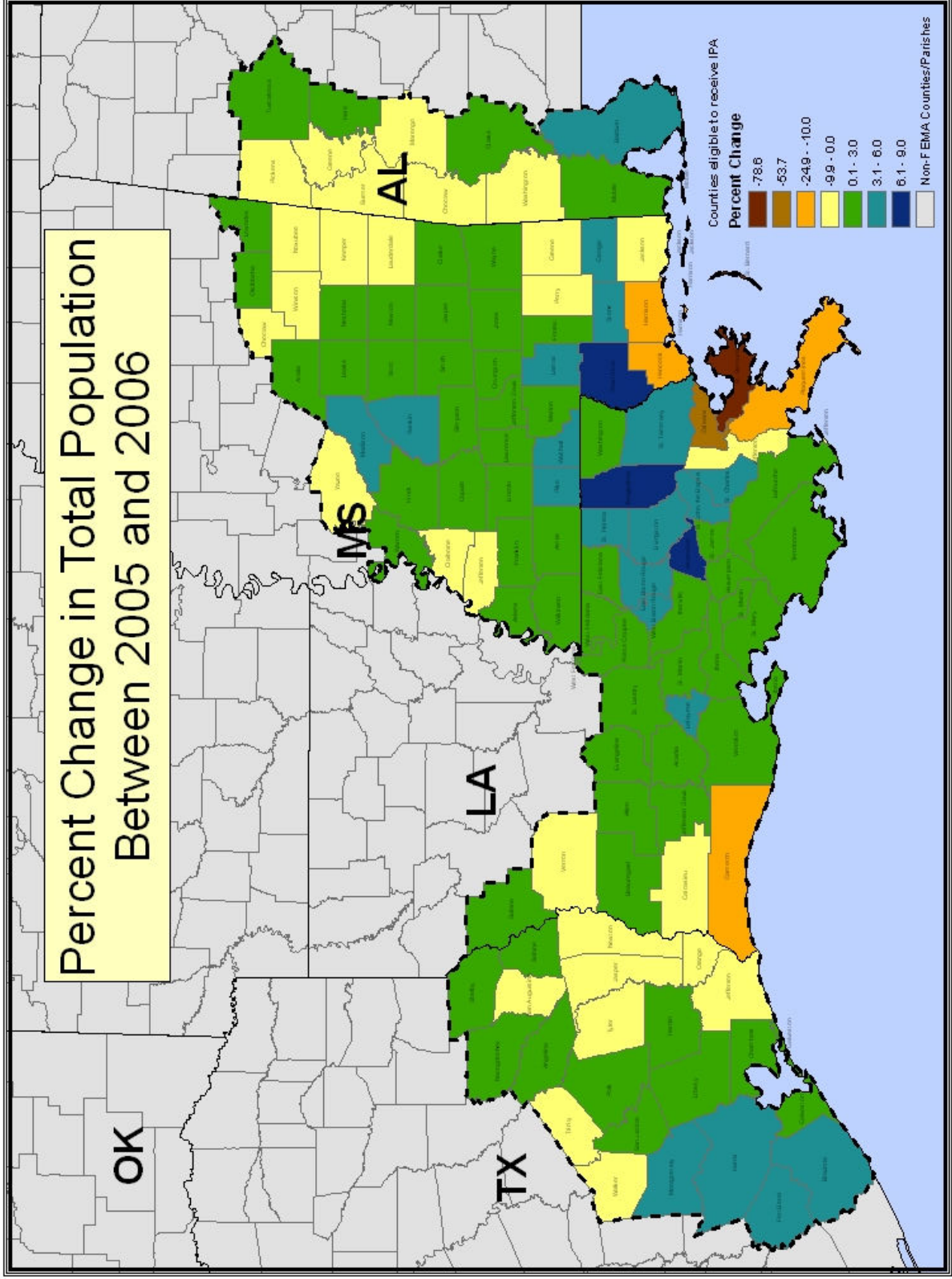
Source: U.S. Census Bureau

Figure 6: Net Migration Rates, Migration Year 2005-2006



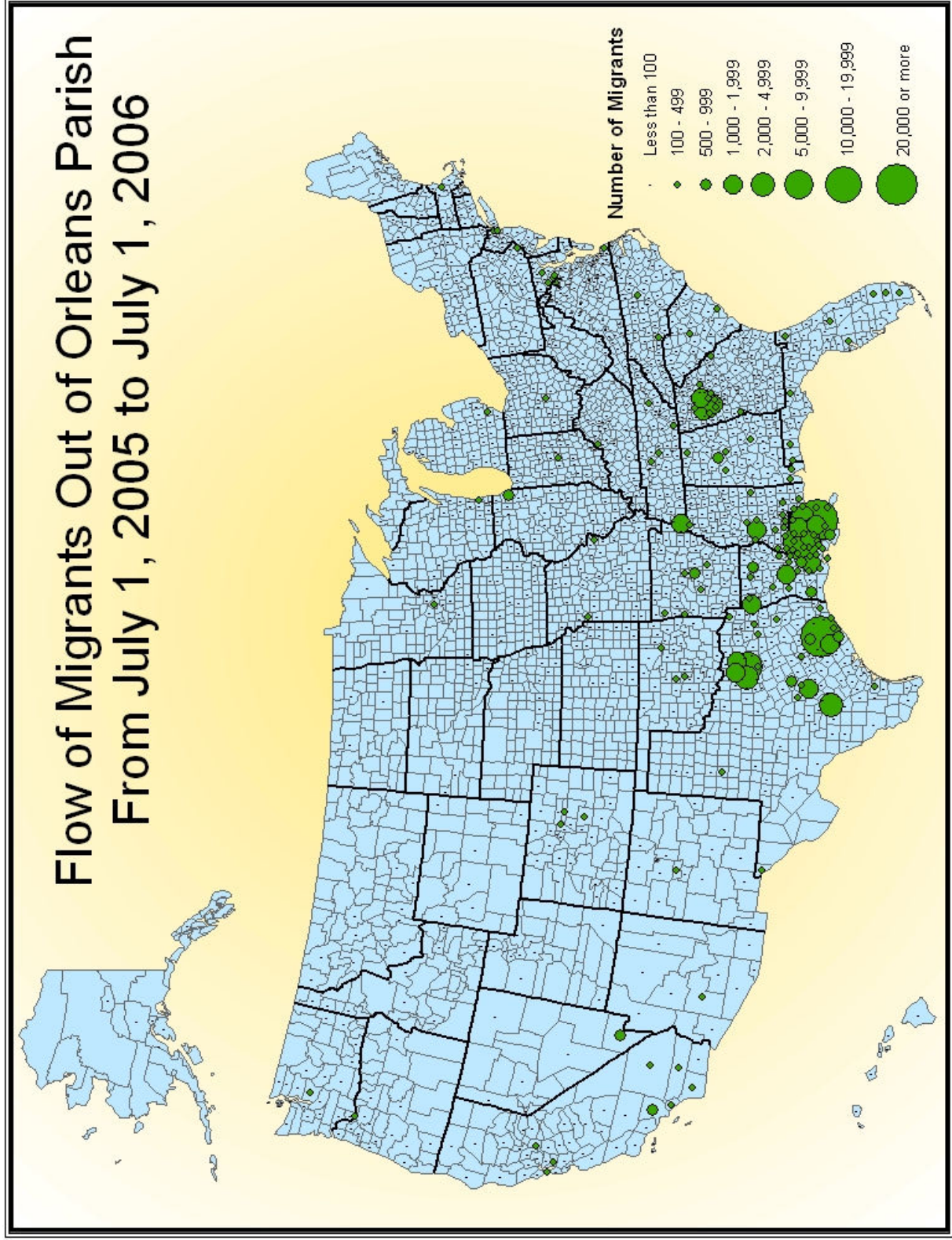
Source: U.S. Census Bureau

Figure 7: Percent Change in Total Population: July 1, 2005 – July 1, 2006



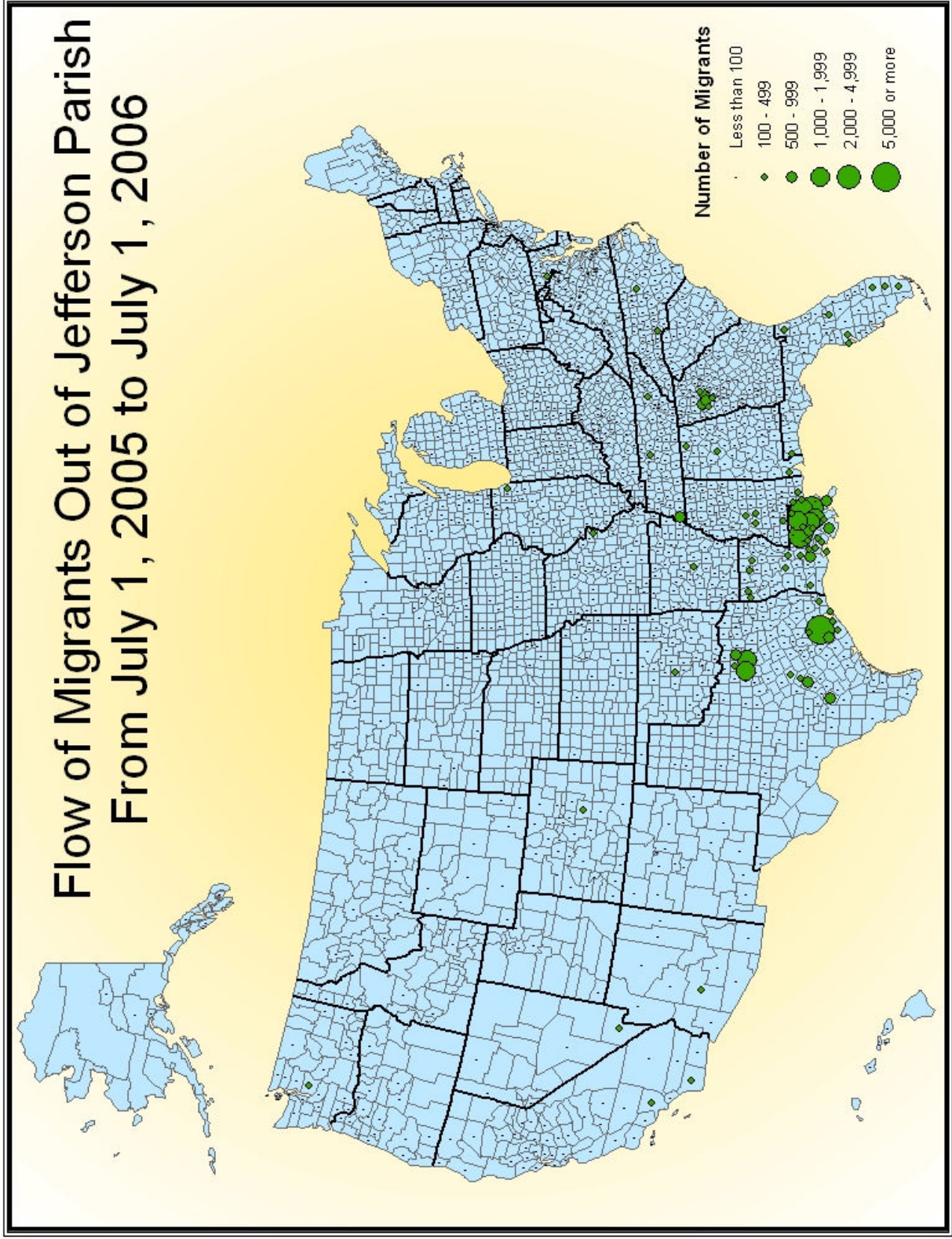
Source: U.S. Census Bureau

Figure 8: Flow of Migrants Out of Orleans Parish: July 1, 2005 - July 1, 2006



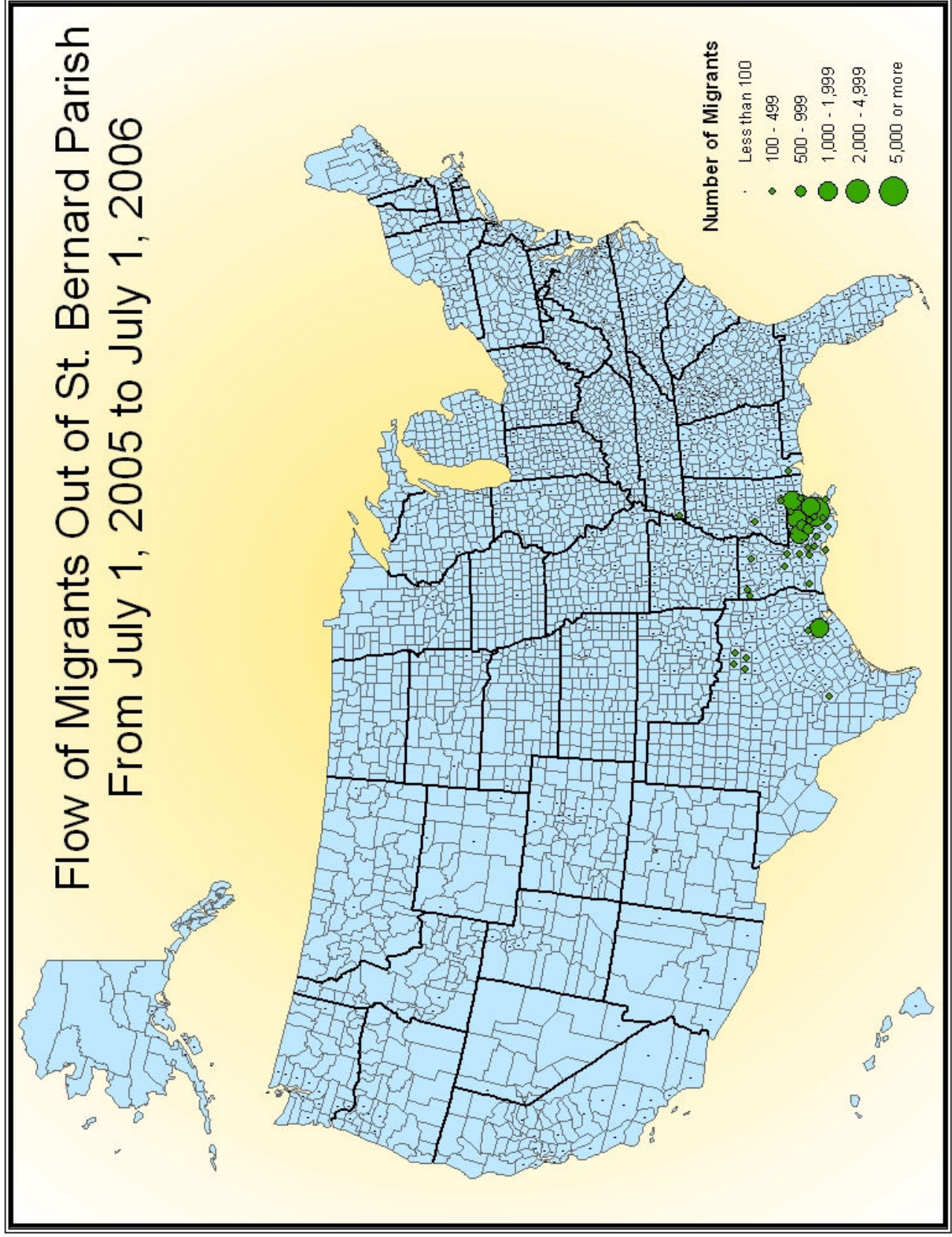
Source: U.S. Census Bureau

Figure 9: Flow of Migrants Out of Jefferson Parish: July 1, 2005 – July 1, 2006



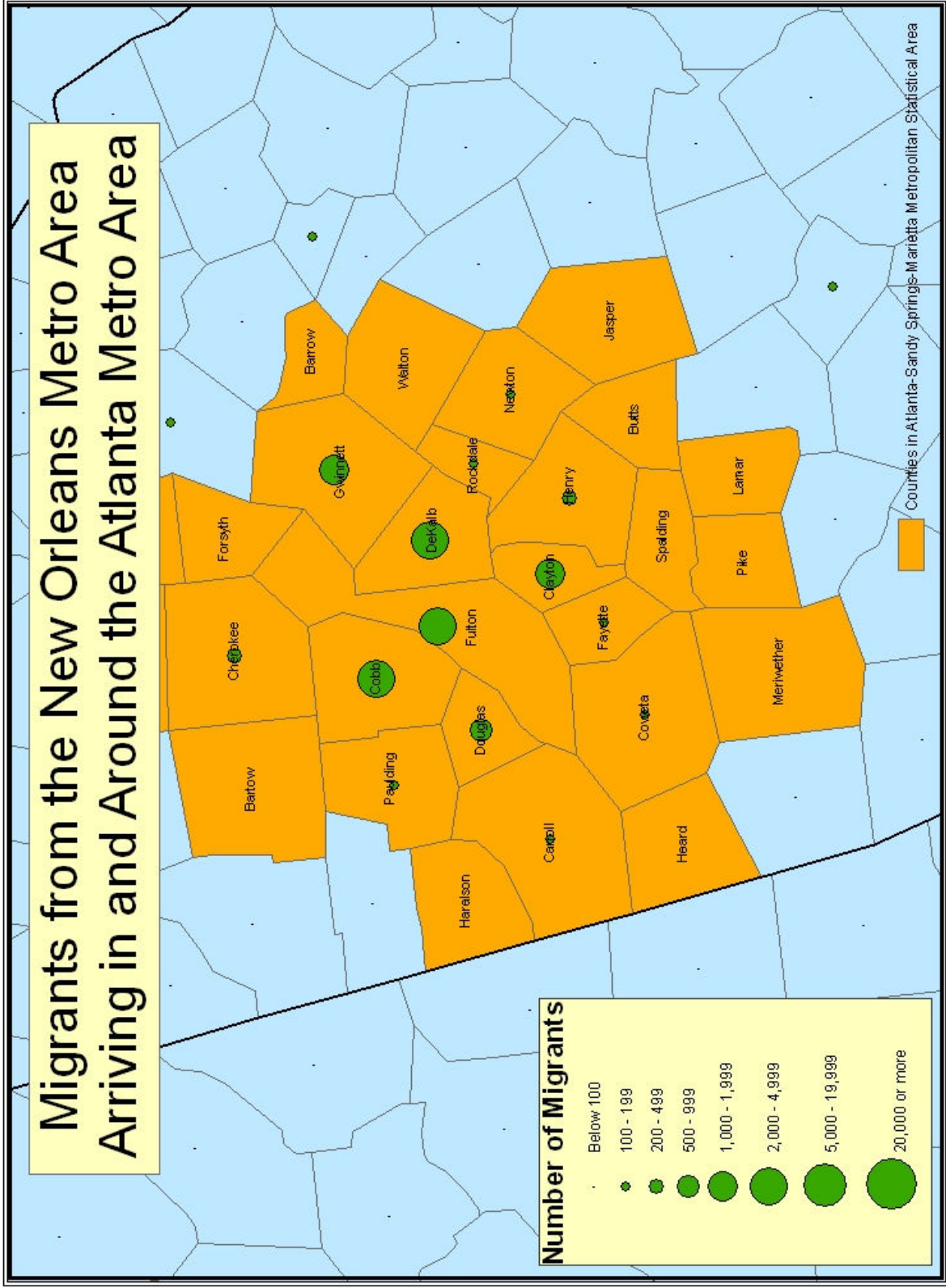
Source: U.S. Census Bureau

Figure 10: Flow of Migrants Out of St. Bernard Parish: July 1, 2005 – July 1, 2006



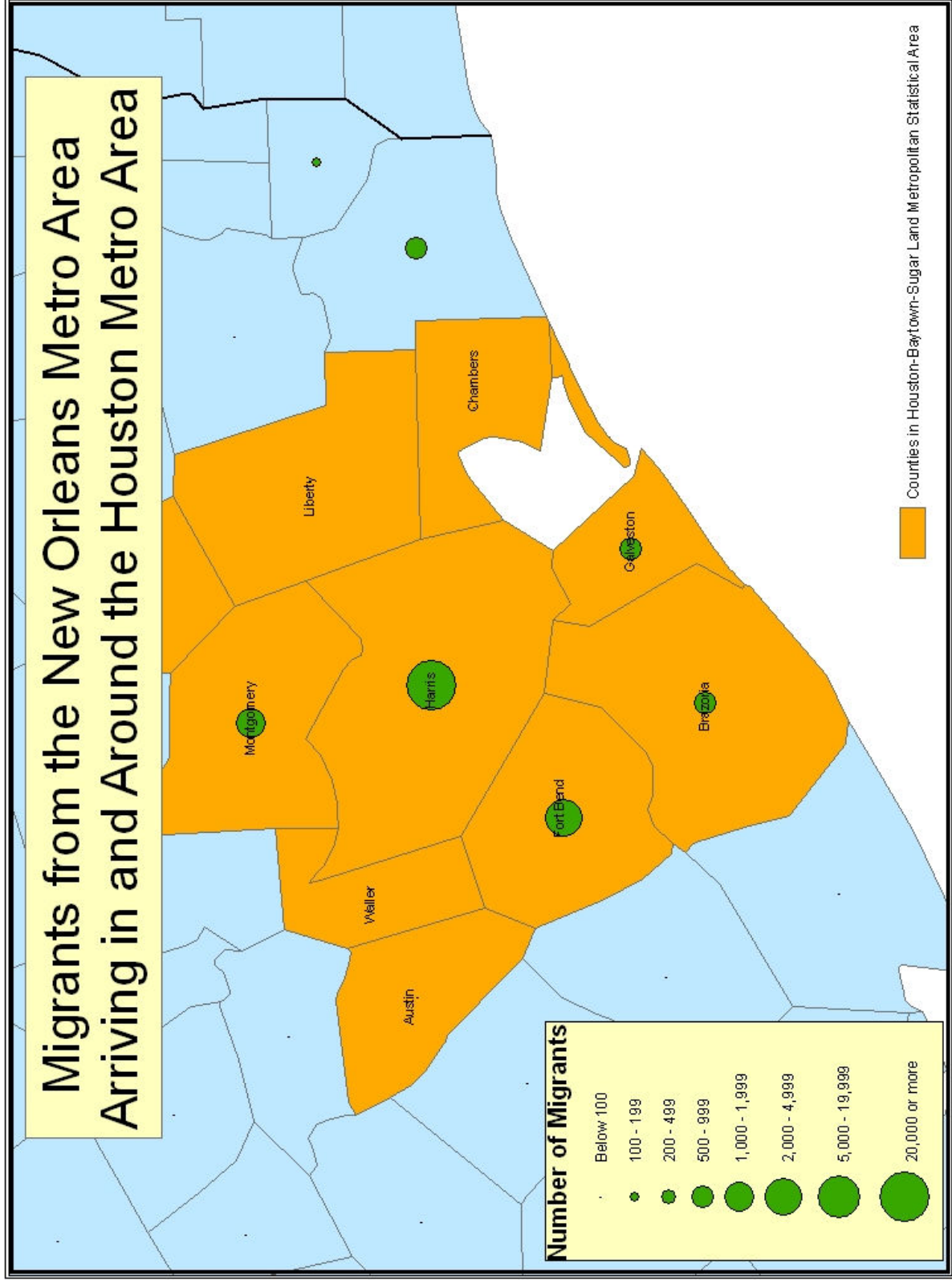
Source: U.S. Census Bureau

Figure 11: Migrants from the New Orleans MSA Arriving in and Around the Atlanta, Georgia Metro Area: July 1, 2005 – July 1, 2006



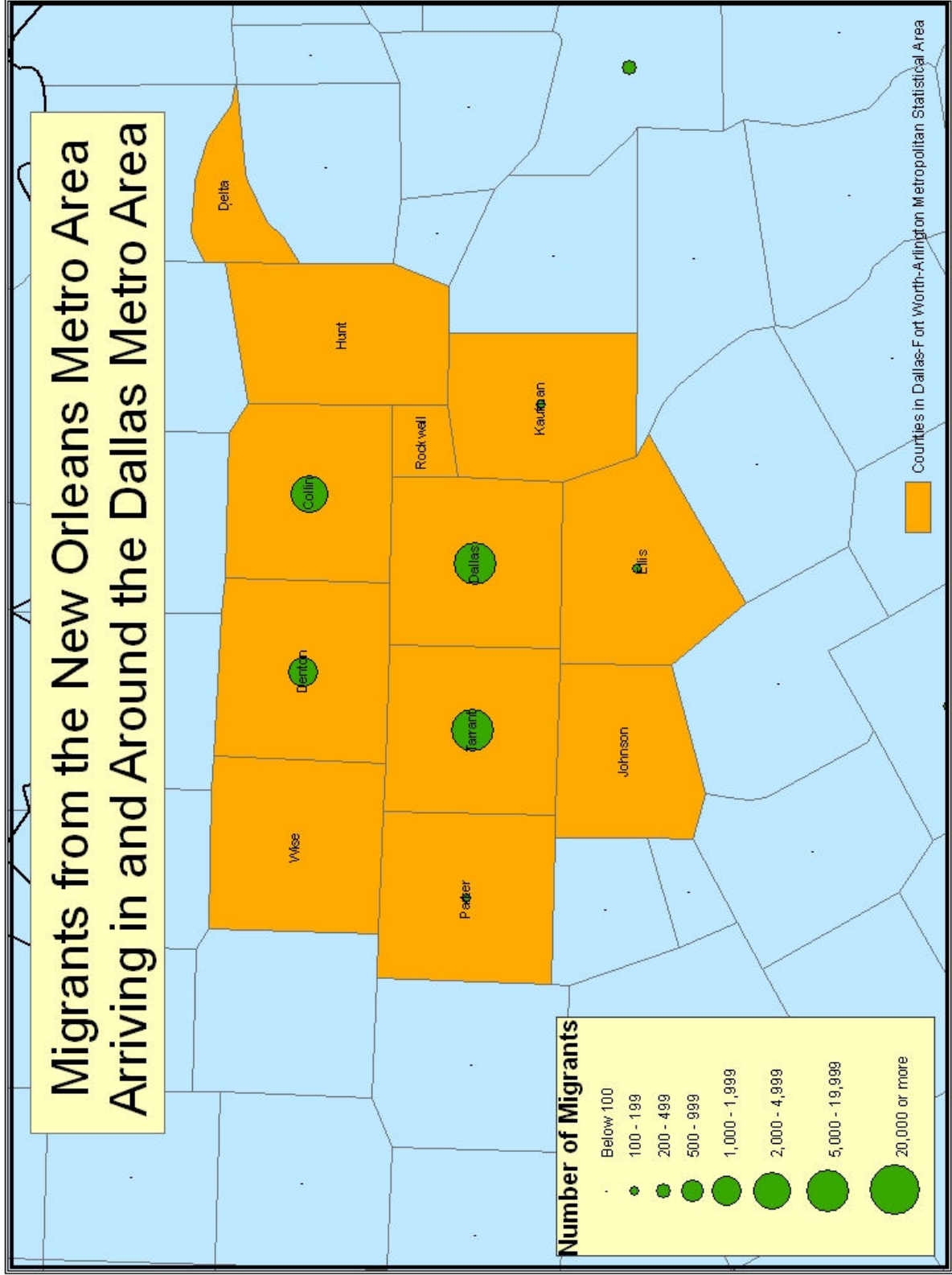
Source: U.S. Census Bureau

Figure 12: Migrants from the New Orleans Metro Area Arriving in and Around the Houston, Texas Metro Area: July 1, 2005 – July 1, 2006



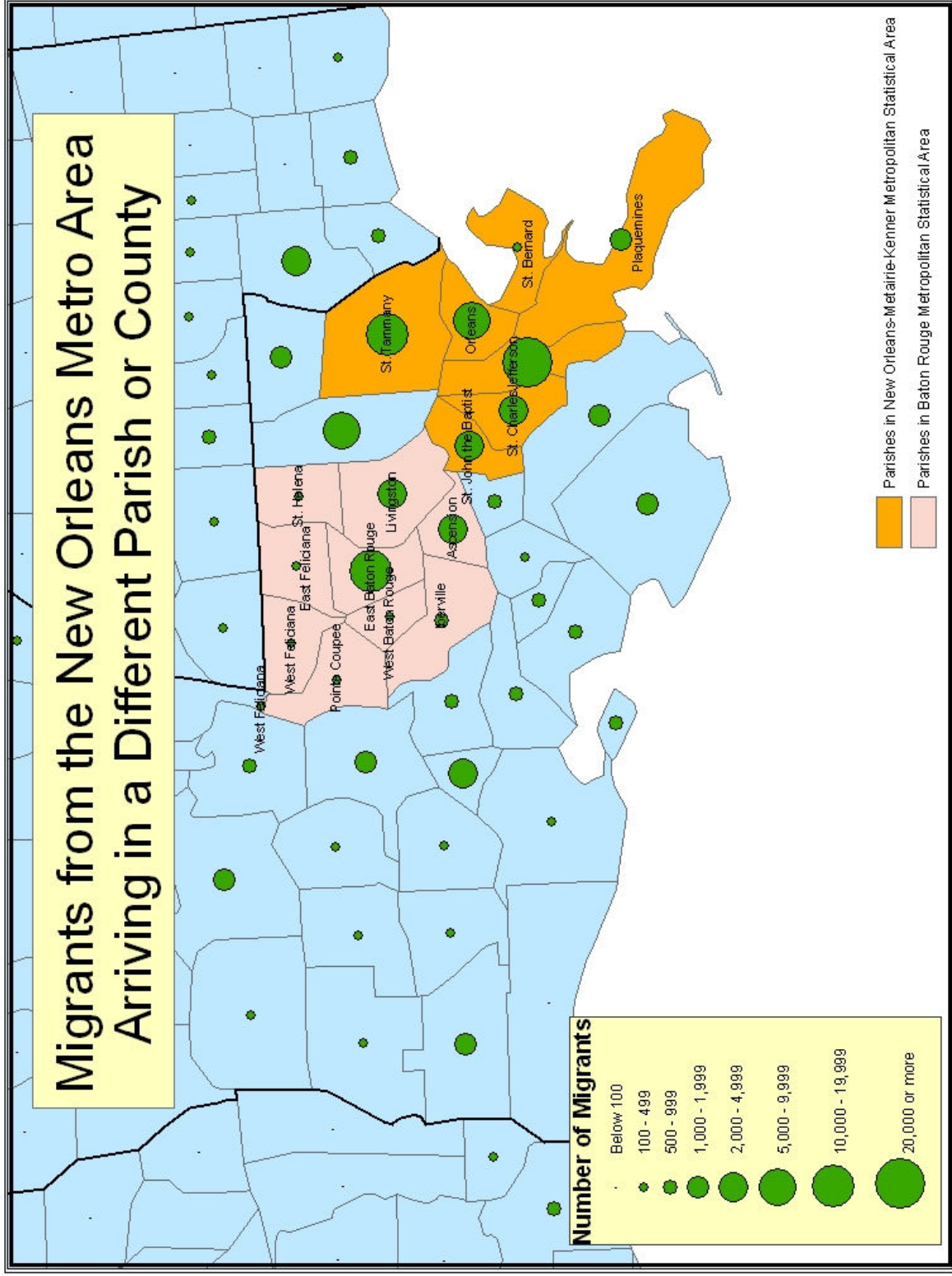
Source: U.S. Census Bureau

Figure 13: Migrants from the New Orleans Metro Area Arriving in and Around the Dallas, Texas Metro Area: July 1, 2005 – July 1, 2006



Source: U.S. Census Bureau

Figure 14: Migrants from the New Orleans Metro Area Arriving in a Different Parish or County: July 1, 2005 – July 1, 2006



Source: U.S. Census Bureau