Using U.S. Postal Service delivery statistics to track population shifts following a catastrophic U.S. disaster

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Background

After catastrophic natural disasters, authorities, relief agencies and businesses have an urgent need to determine the impact on population distribution. This is true immediately after a large scale evacuation and also months and years after the disaster as large numbers of people migrate back to the affected area and leave areas to which they had been displaced. Initial relief as well as ongoing recovery and redevelopment initiatives require timely and up-to-date population estimates. Businesses need up-to-date population estimates to assess market potential, and authorities need timely population estimates to determine the level of essential human services needed such as hospitals, community clinics, public transportation, and schools.

Standard sources of population estimates cannot meet these needs. The Census Bureau produces yearly population estimates for counties, but these are reported with a nine month lag. This paper focuses on U.S. Postal Service monthly residential address counts for parishes (counties) in Louisiana as potential contributors to post-catastrophe county level population estimates. Specifically, this paper addresses these questions:

- How do USPS based estimates perform relative to other estimates under normal and extraordinary circumstances*?*
- How accurate are post-disaster population estimates based on USPS data?
- How do USPS based estimates perform relative to other estimates in parishes most affected by the hurricanes*?*

Every month, the United States Postal Service reports the number of residences actively receiving mail. These data are reported for carrier routes and ZIP Codes across the United States. High level officials have begun to rely on monthly USPS statistics to assess the population recovery of the New Orleans area following the devastation caused by the massive flooding of the city after Hurricane Katrina. In May 2007, the U.S. Department of Housing and Urban Development began publishing USPS counts of residences and businesses actively receiving mail by census tract for use by researchers and analysts assessing housing recovery. And at the same time, the Brookings Institution and the Greater New Orleans Community Data Center began publishing the number of residences actively receiving mail by parish in the New Orleans metro area as well as the proportion that number represented of the pre-Katrina number as an indicator of population recovery. Chairman Donald E. Powell's Office of Recovery and Rebuilding in the Gulf Coast Region, U.S. Department of Homeland Security, has used monthly USPS statistics when briefing high level White House officials on the status of the recovery (D. Vogel, personal communication, August 1, 2007). And the Senate Committee on Banking, Housing and

Urban Affairs in September 2007 reviewed current USPS statistics "to track population and demographic shifts in the region on a more regular and current basis than the Census" (Liu 2007:5). Despite our incomplete understanding of the extent to which changes in USPS data are indicative of population change, these data are used for assessing post-Katrina impact and recovery because they are publicly available and reported frequently with little time lag.

Commercial firms rely on these counts as an indicator of change in population size for small areas, but little research has been reported on their performance during normal or extraordinary times. The few available papers that have examined the USPS data's usefulness support the notion that USPS data may be useful as a basis for population estimates for larger areas. However, they suggest that this data set may perform differently in counties with larger proportions of seasonal housing, rural housing units, or group quarters population (Jacobsen, Hodges and Wilcox 2002; Lowe and Mohrman 2003; Staab and Iannacchione 2003).

How do USPS based estimates perform relative to other estimates under normal and extraordinary circumstances*?*

Methodology

We examined several alternative methods for using the USPS counts as an input to population estimates under normal circumstances and compared the results of each to Census Bureau estimates for the same year. When comparing one set of estimates to another, neither can be considered the standard for accuracy, so we calculated a mean absolute percent difference (MAPD), using the mean of the two estimates as the denominator – a measure used by Hodges (1998).

Population estimates for all Louisiana parishes were generated for 2001 through 2005 based on USPS data using the three methods described below.

First, the *Censal Ratio Method* was employed based on mid-year 2000 USPS counts and Census 2000 population counts. This method applies the ratio of 2000 census population over 2000 USPS address counts to the USPS address counts for the estimate year. This is the same as applying the rate of change in USPS addresses (from 2000 to estimate year) to the 2000 census population count.

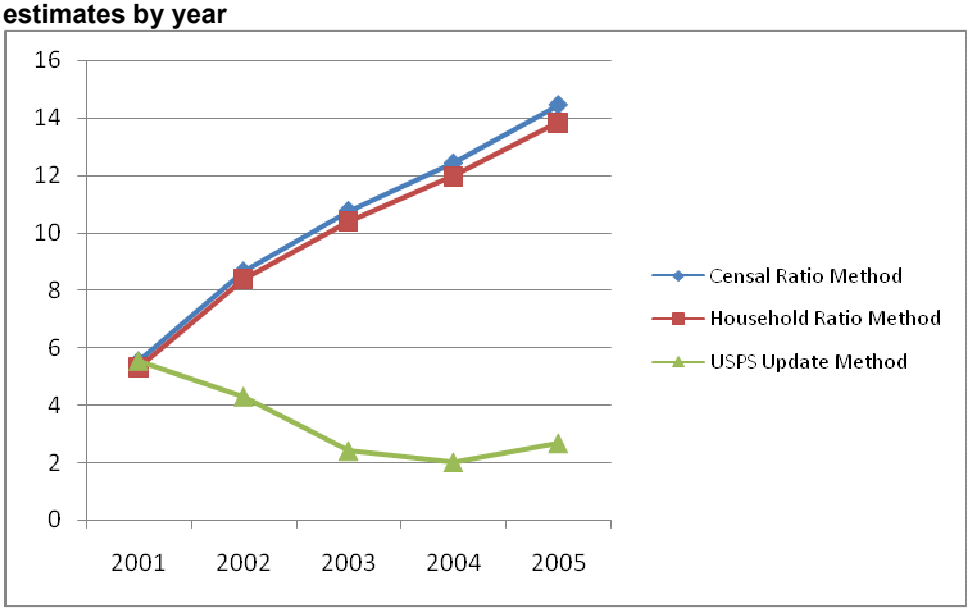
Because USPS counts may be closer to occupied housing units than to total population, a second set of estimates were generated applying the rate of change in USPS addresses (from 2000 to estimate year) to the 2000 census count of occupied housing units. Then the Census 2000 average persons per household for each parish was applied to the estimate of occupied housing units to develop a household population estimate, and the 2000 group quarters count was added for a total population estimate. We'll call this method the *Household Ratio Method.*

Finally, a third method is to calculate the rate of change in USPS data from year to year and apply it to the previous year's Census Bureau population count or estimate. This method simply uses the USPS data to generate an update to the Census Bureau estimate without the lag time associated with the Census Bureau's estimates. This method has been frequently used post-Katrina to generate monthly population estimates for Orleans Parish. We will call it the *USPS Update Method*.

Results

The *Censal Ratio Method* and the *Household Ratio Method* both produced large MAPDs from Census Bureau estimates that grew from one year to the next and reached 14.5 and 13.9 respectively by 2005, (See Figure 1). The MAPDs associated with the *Household Ratio Method* were somewhat smaller suggesting that it is slightly more effective to use the USPS data to estimate households first, and then derive population. Nonetheless, the fact that these two methods result in large MAPDs that increase each year suggests that the USPS data do not offer a simple solution[1].

Figure 1: MAPD across all Louisiana parishes of three USPS estimate methods compared to Census estimates by year



Not surprisingly the *USPS Update Method* performed much better than the first two methods. The *USPS Update Method* had a MAPD of 5.5 in 2001, which fell to 2.0 by 2004, and increased slightly to 2.7 by 2005. We would not expect nor desire any estimate method to exactly match the Census Bureau's estimates, given that the Census Bureau estimates themselves contain some error. For example, the nationwide county level Mean Absolute Percent Error (MAPE) for Census Bureau estimates was 3.3 in the year 2000, and 3.8 across the southern region of the country (Baker 2001). The MAPDs associated with the *USPS Update Method* are within a range that suggests that USPS data may be useful for generating estimates that avoid the 9-month lag associated with the Census.

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[1] Jacobsen et al (2002) point out that administrative data sets commonly are subject to significant procedural changes that may affect the quality of the data from one year to the next. This seems to be the case for the USPS delivery statistics. We know, for example, that in 2004, the USPS renegotiated its contracts with postal carriers serving rural areas and stopped counting vacancies in rural areas at that point (L. Wombold, personal communication, February 2, 2007; T. Lowe, personal communication, October 1, 2007). These kinds of procedural and definitional changes in database construction can cause counts to vary dramatically from one year to the next in ways that are not related to changes in population or occupied housing units.

This, then, raises the question, what level of difference there might be if we compared the *USPS Update Method* to estimates resulting from simply extrapolating the Census estimates forward one year. In order to answer this question, we generated population estimates for 2002-2006, by calculating a simple rate of change in the census estimates for the two previous years, and applying that rate to the most recent census estimate to arrive at a current estimate. We found that the level of difference (MAPD) between these simple extrapolation estimates and Census Bureau estimates was very small (consistently around 0.5) from 2002-2005. However, after the hurricanes the difference spikes to 5.2[2]. The 2005 and 2006 distribution of percent differences between the Census extrapolations and the Census Bureau estimates further dramatize how poorly the Census extrapolations performed following the hurricanes (See Table 1). In contrast, the *USPS Update Method* estimates continued to perform at the same levels as before the storm with a MAPD of 3 in 2006 (See Figure 2).

Figure 2: MAPD across all Louisiana parishes of Census estimate extrapolations and USPS Update Method estimates compared to Census estimates

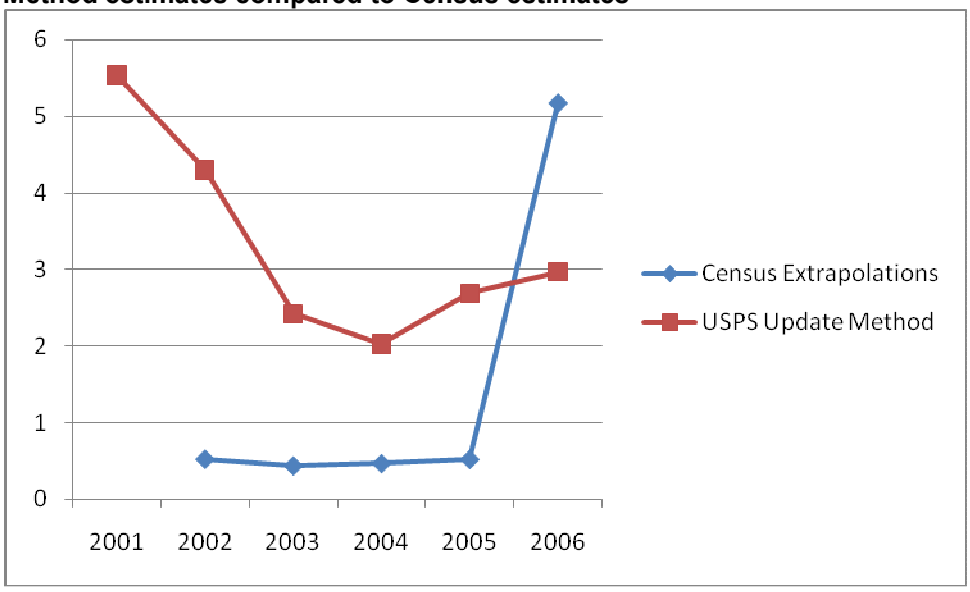


Table 1: Distribution of percent difference of Census extrapolations compared to Census estimates for Louisiana parishes before and after Katrina

Percent difference	**2005**	**2006**
<=-5%	0	2
-4.9% to -2.5%	0	8
-2.5% to -0.1	63	45
0 to 2.5%	1	4
2.6% to 5%	0	1
over 5%	0	4
Total	64	64

[2] We used the original 2006 Census Bureau estimates for these calculations, because the revised 2006 estimates were not available at the time of analysis.

Under normal circumstances, simple extrapolations of Census Bureau estimates seem to be a good way to produce county level population estimates without the 9 month lag associated with the release of the Census Bureau estimates. But this method performs very poorly after massive population displacement. The USPS based estimates on the other hand, track population in a relatively consistent manner despite the extraordinary circumstances.

How accurate are post-disaster population estimates based on USPS data?

In the near term, the error associated with using USPS data as a basis for population estimates cannot be determined without an official census with which to compare these estimates. However, we would expect all estimates to have a fairly high error rates following these catastrophic events. Many evaluations reveal that population estimates tend to be less accurate for rapidly growing or declining counties and less accurate for counties where the historical development patterns have been interrupted (Rives et al 1995; Siegel and Swanson 2004). These conditions are certainly present in hurricane-affected parishes. Thus, drawing conclusions from comparisons of USPS based population estimates and Census Bureau population estimates generated after the 2005 hurricanes is problematic because the error rate of both is likely to be relatively high.

Although we can't know how accurate either the USPS-based estimates, the Census Bureau estimates or any other post-hurricane estimates are, we can see how different they are, and these differences suggest something about the overall level of uncertainty associated with population estimates after the massive population displacement that followed Hurricanes Katrina and Rita.

The Louisiana Department of Health and Hospitals (DHH) also developed parish level population estimates immediately after the hurricanes. For this task they acquired public school enrollment data to produce monthly estimates using a modified Censal Ratio Method. Specifically, they calculated a ratio of public school enrollment to total population count in 2000, as well as ratios of public school enrollment to total population estimates for 2001 through 2004, and then calculated a five year trend of the ratios to apply to the monthly 2005 and 2006 public school enrollments (Chapman and Dailey 2005). They used this method to calculate estimates for all parishes except Orleans Parish where very few public schools were open and public school capacity was greatly constrained.

Although DHH lacked an estimate for July 1, 2006 (because schools do not report enrollment in the summer), DHH did produce estimates for May 2006 and again for October 2006. A comparison of the May 2006 DHH estimates to the Census Bureau July 2006 estimates resulted in a MAPD of 3.3. A comparison of the October 2006 DHH estimates to the Census Bureau July 2006 estimates resulted in a MAPD of 3.5. Thus the DHH estimates differed from the Census Bureau estimates at about the same level as the USPS estimates did. We also compared USPS estimates based on October 2006 data from the USPS to DHH's October 2006 estimates and found that these two sets of estimates differed more than either of these estimates differed from the Census Bureau estimates. The MAPD between the October 2006 USPS estimates and the DHH estimates from for October 2006 was 4.3 (See Table 2).

Table 2: Mean Absolute Percent Differences for all Louisiana parishes except Orleans Parish

	USPS July 06 vs Census July 06	DHH May 06 vs Census July 06	DHH Oct 06 vs Census July 06	USPS Oct 06 vs DHH Oct 06
MAPD	2.9	3.3	3.5	4.3

In 2006, the Louisiana Public Health Institute (LPHI) conducted sample surveys in eleven hurricane-impacted parishes. This activity resulted in total household population estimates for each parish with a margin of error. The researchers also gathered data on group quarters population for each parish in order to determine a total population estimate for each parish. Applying the margin of error to the household population estimate for each parish and then adding the group quarters population, we generated a high and low population estimate.

Comparing this estimate range to the Census Bureau estimates and the *USPS Update* estimates, we found that both the Census Bureau estimate and the *USPS Update* estimate fell within the high/low range of the LPHI estimates for eight of the parishes and both the Census estimate and the USPS estimate fell outside the range for three of the parishes. Interestingly, both the Census and USPS estimates fell outside of the LPHI range for the same three parishes: Orleans, Plaquemines and St. Bernard (See Table 3). These three parishes were the most heavily damaged parishes in the New Orleans area and likely experienced the greatest level of population displacement of all the parishes. It is understandable that it would be most difficult to develop reliable population estimates for these three parishes. In fact, these comparisons point to the need for a closer examination of percent difference among estimates for those counties most affected by the disaster.

Table 3: Comparison of LPHI, Census Bureau and USPS estimates

	LPHI Low	LPHI High	Census 06 estimate	USPS estimate 06	FEMA Percent of occupied housing units with major/severe damage
St. Helena	10193	12341	10,759	10,779	2.0%
Tangipahoa	95620	132032	113,137	111,033	2.3%
Washington	40355	48473	44,750	44,778	8.4%
Calcasieu	173970	214580	184,524	187,141	9.3%
Vermillion	53000	64740	56,021	56,533	13.0%
Jefferson	394763	485173	431,361	445,673	19.5%
St. Tammany	196953	249469	230,605	221,122	25.5%
Orleans	182316	219014	223,388	235,961	55.9%
Plaquemines	16006	20936	22,512	29,826	57.5%
Cameron	5998	8914	7,792	8,427	71.8%
St Bernard	22074	28904	15,514	38,292	78.4%

How do USPS based estimates perform relative to other estimates in parishes most affected by the hurricanes*?*

In August and September of 2005, several Louisiana parishes experienced significant levels of storm-related damage and population loss, while other parishes experienced population increases due to an influx of evacuees from the affected parishes. As noted in Table 3, Orleans, Plaquemines, Cameron, and St. Bernard parishes all experienced major or severe damage to more than 50 percent of occupied housing units as estimated by FEMA. Not surprisingly, the absolute percent differences between Census estimates and USPS based estimates are largest for these four counties. Although the MAPD overall

between Census estimates and USPS based estimates was 3, the MAPD for these four heavily damaged parishes was 31.5, with the USPS update method generating a higher estimate than the Census Bureau for all four parishes.

In contrast, many Louisiana parishes received a large number of evacuees as demonstrated by public school enrollment figures. Public schools in eight Louisiana parishes saw enrollment increases of between 1,000 and 6,000 students in October 2005 as compared with October 2004. These additional students represented increases of between two and 17 percent depending on the parish. Although the MAPD between Census estimates and USPS based estimates for these ten parishes was not high (only 1.2), what is notable is that for each of these parishes, the USPS update method generated a *lower* estimate than the Census Bureau estimate.

To further understand the performance of the USPS based estimates relative to other estimates in the most affected parishes, an examination of the patterns in the underlying administrative data sets might be useful to see where and when they diverge.

Trends in USPS counts and school enrollment data immediately following Katrina and Rita

There are availability issues associated with the administrative data sets that form the basis for the Census Bureau estimates. Even if these sources were readily available to users outside the Census Bureau, the lag with which they are reported, and questions about their post-Katrina performance limit their value in an immediate post-catastrophe environment. In contrast, USPS and school enrollment data appear to experience relatively short disruptions, and are more readily available to users. The trends in the USPS and school enrollment data reveal some interesting patterns in the months following the hurricanes.

Looking first at those parishes that experienced the greatest level of housing damage, we see that the USPS counts remained frozen for many months. These observations relative to the New Orleans area were first documented in a May 2007 unpublished paper by Plyer and are expanded here to encompass southwestern Louisiana affected by Rita. For all four parishes that sustained major or severe damage to more than 50 percent of occupied housing units (Orleans, Plaquemines, St. Bernard and, in southwest Louisiana, Cameron Parish), USPS counts of active residences remained essentially static from July 2005 -- just before the destruction -- through at least the end of 2005 (See Table 4). This suggests that the post office was not providing updated counts of active addresses during those months, perhaps because they were not able to supply door-to-door mail delivery for several months after the disasters.

Table 4: FEMA housing damage estimates and USPS counts of active residences for the four most heavily damaged Louisiana parishes

Parish	% occupied housing units with major or severe damage	USPS counts July 05	USPS counts Aug 05	USPS counts Sep 05	USPS counts Oct 05	USPS counts Nov 05	USPS counts Dec 05
St. Bernard Parish	78.4%	25,651	25,659	25,658	25,658	25,658	25,658
Cameron Parish	71.8%	3,059	3,061	3,071	3,071	3,073	3,082
Plaquemines Parish	57.5%	8,392	8,393	8,382	8,382	8,382	8,384
Orleans Parish	55.9%	198,227	198,146	198,114	198,114	198,116	193,197

Looking at those parishes that received a large influx of evacuees as demonstrated by increases in public school enrollment we observe quite a different phenomenon. In each of these parishes the number of residences actively receiving mail trended upward each month from July 2005 through the end of 2005 (See Table 5). However, the number of new residences that became "active" between July 2005 and October 2005 were not likely adequate to accommodate the numbers of public school children and their families that had arrived by that point.

Specifically, 2,783 additional residences began to actively receive mail by October 2005 across these eight parishes, while 16,252 additional students arrived in public schools in these same parishes during this same time. The likelihood that 2,783 new residences accommodated 16,252 additional public school children and their families (almost 6 children per residence) is very remote. In fact we know that many evacuees were housed for some time in shelters and hotels until more permanent accommodations could be arranged. This leads us to conclude that USPS counts of active residences did not adequately reflect the *influx* of evacuees experienced by many Louisiana parishes in the months immediately following Hurricanes Katrina and Rita.

This is not a flaw in the USPS data per se. USPS counts reflect growth and decline in households rather than population. If the experience of receiving parishes was that they received many people, but added few active addresses, then the USPS data reflected that fact. The difficulty of estimating the sudden increase in population lies with our inability to estimate changes in average household size and, potentially, group quarters population.

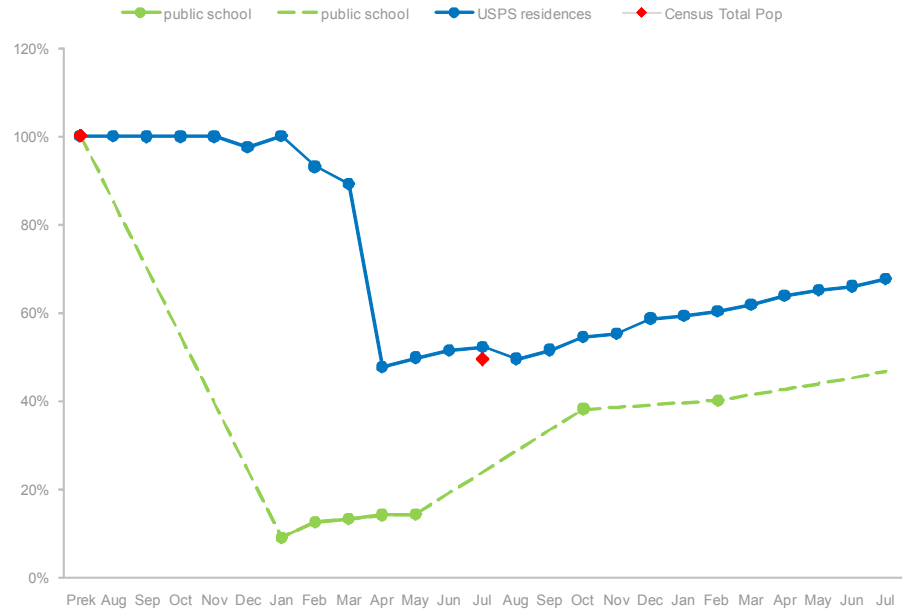
Table 5: Public school enrollment and USPS counts of active residences for parishes with a the largest influx of public school students

Parish	public school student influx	**USPS counts July 05**	**USPS counts Aug 05**	**USPS counts Sep 05**	**USPS counts Oct 05**	**USPS counts Nov 05**	**USPS counts Dec 05**
East Baton Rouge Parish	5112	171,557	171,732	171,964	172,107	172,383	172,691
Ascension Parish	2198	30,975	31,477	31,530	31,718	32,171	32,323
Lafayette Parish	1995	2,827	2,844	2,850	2,865	2,887	2,889
Rapides Parish	1849	47,246	47,303	47,321	47,416	47,574	47,601
Livingston Parish	1646	38,223	38,383	38,425	38,857	39,060	39,124
Caddo Parish	1253	102,191	102,333	102,368	102,397	102,412	102,446
St. John the Baptist Parish	1120	14,493	14,496	14,495	14,495	14,503	14,553
Tangipahoa Parish	1079	36,819	36,982	37,154	37,259	37,508	37,622
Total	16252	444,331			447,114		
				July 05 to Oct 05 change in active residences	2,783		

Analyzing longer term trends in the data—parishes with catastrophic damage
By graphing 12 or more months of normalized USPS data, school enrollment data, and the 2006 Census estimate we see some very interesting patterns in the data by parish type.

In Orleans Parish beginning in approximately August 2006, the USPS data indicates steady population gains that are mirrored by the school enrollment, albeit at a lower rate (See Figure 3).

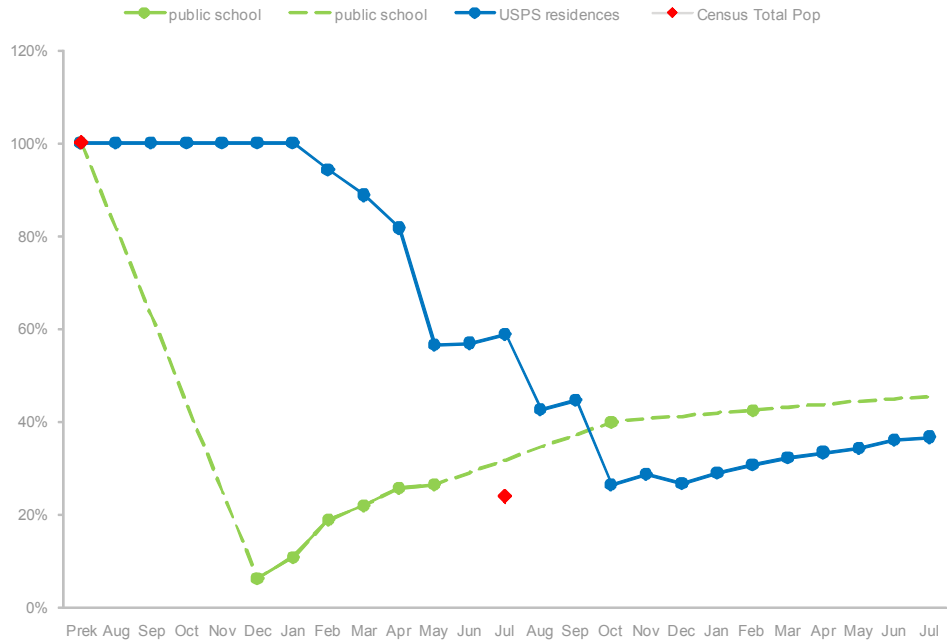
Figure 3: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates for Orleans Parish



An analysis of the 2006 American Community Survey demographic profiles of post-Katrina New Orleans by the Brookings Institution revealed that households with children were significantly less likely to have returned to New Orleans than households without children by 2006, and that the 2006 population of New Orleans had a higher proportion of couples without children and people living alone than before the storm (Frey, Singer and Park 2007). This demographic analysis may help to explain the lower rate at which the public school population rebounded as compared with the rate the overall population rebounded as reflected in the USPS data.

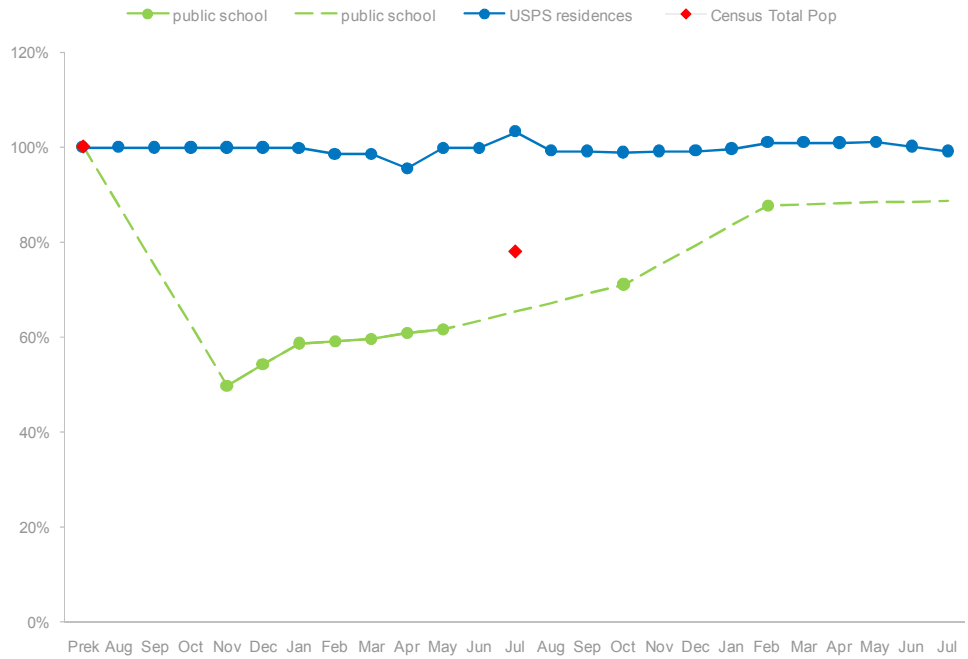
In St. Bernard Parish, a larger proportion of housing units sustained severe or major damage than in Orleans Parish. It appears that the USPS took longer to recover and was not able to begin reporting accurate counts of residences actively receiving mail until late 2006, when trends in the USPS data mirrored upward trends in public school enrollment data. In contrast to Orleans Parish, however, the general population seemed to be rebounding more slowly than the public school population in St. Bernard Parish (See Figure 4). Sample surveys conducted in 2006 and analyzed by Hori and Bowman (2006) revealed that a large proportion of evacuees from St. Bernard Parish settled in nearby St. Tammany Parish. It is possible that St Bernard families in St. Tammany were able to continue to send their children to school in their home parish due to its proximity.

Figure 4: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates for St. Bernard Parish



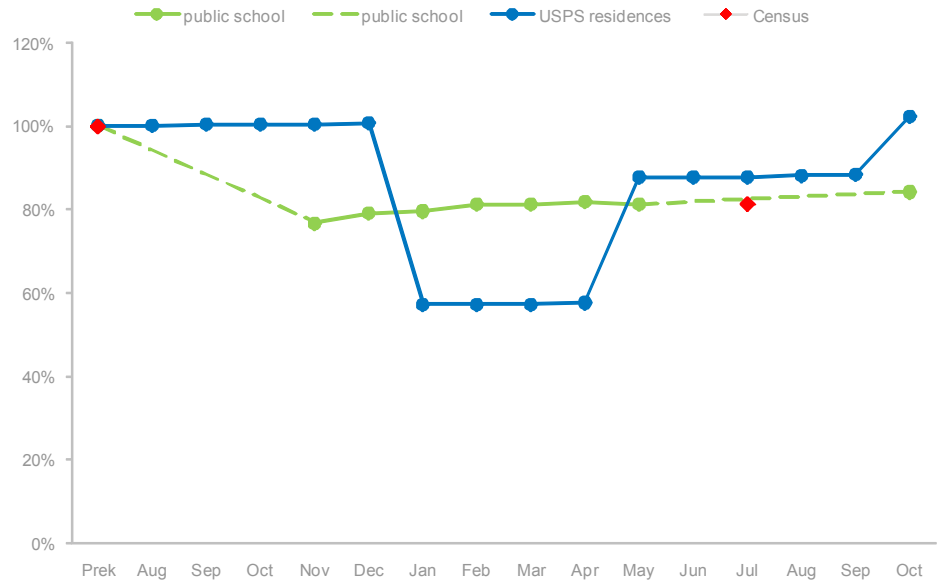
USPS data for the more rural parish of Plaquemines is more difficult to explain (See Figure 5). Although 58 percent of occupied housing units are estimated to have sustained major or severe damage, and according to Census estimates the population dropped by 22 percent from 2005 to 2006, but USPS counts through July 2007 never fall below 98 percent of pre-Katrina.

Figure 5: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates for Plaquemines Parish



The USPS data for Cameron Parish, which is also quite rural, is similarly difficult to explain. Despite severe or major damage to 72 percent of occupied housing units in that parish, the USPS count of approximately 3,000 active residences in that parish remained frozen for several months following the landfall of Hurricane Rita, then it dropped dramatically in January 2006, but rose again to approximately 3,000 in October 2006. In contrast, the decline and recovery of school enrollment more closely matches the Census Bureau estimate of recovery for that parish.

Figure 6: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates for Cameron Parish



Because the total population size, number of residences actively receiving mail, and number of students enrolled in public schools are not large in the rural parishes of Cameron and Plaquemines parishes, small differences can mean large changes in these normalized data sets. This may contribute to the difficulty in explaining trends in these data sets. Furthermore, post office officials may be reporting these data differently in rural areas than in urban areas.

Analyzing longer term trends in the data—parishes with moderate damage

Three relatively large parishes neighboring the most devastated parishes, received a moderate level of damage. Specifically, Jefferson Parish sustained severe or major damage to 25.5 percent of occupied housing units, and St. Tammany Parish sustained this level of damage to 19.5 percent of occupied housing units due to Hurricane Katrina. In Calcasieu Parish, 9.3 percent of occupied housing units received severe or major damage due to Hurricane Rita. Based on sample survey results that they analyzed, Hori and Bowman (2006) concluded that all three of these parishes simultaneously lost population and gained evacuees from the more heavily damaged parishes of Orleans, Plaquemines, St. Bernard and Cameron.

In these parishes we notice that although public school enrollment drops moderately to slightly, population remains relatively level or grows (See Figures 7, 8, and 9). This suggests that evacuees who left these parishes and didn't return may have been disproportionately those whose children had been enrolled in public school, and individuals moving *into* the parish were largely childless, sending their children to private school, or sending their children to school in a neighboring parish. Demographic

profiles available from the American Community Survey for Jefferson Parish for both 2004 and 2006 confirm that the proportion of households with children under 18 dropped from 35 percent in 2004 to 32 percent in 2006.

Figure 7: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates in St. Tammany Parish

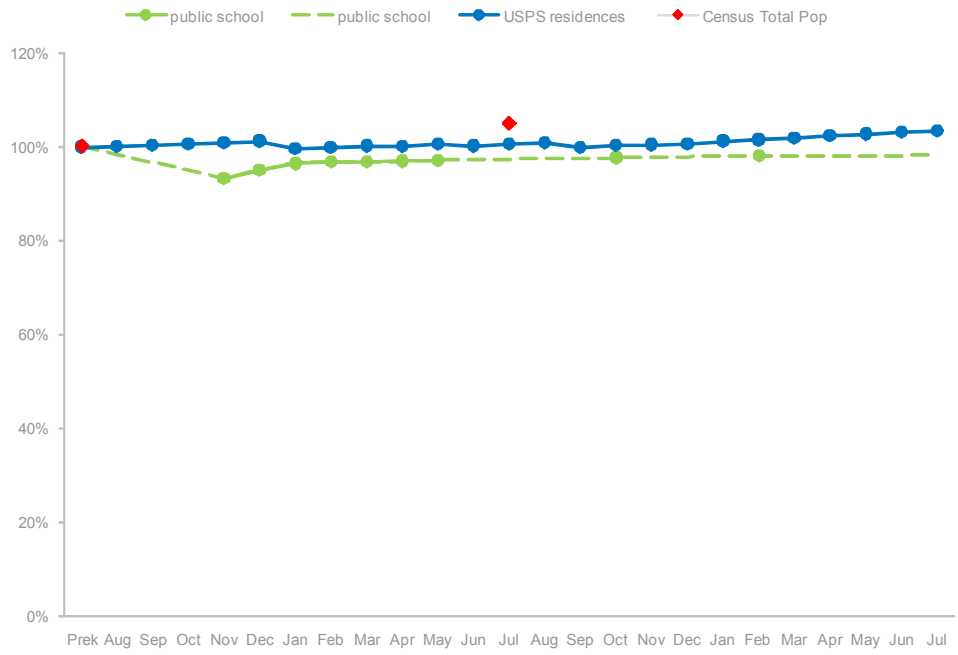


Figure 8: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates for Jefferson Parish

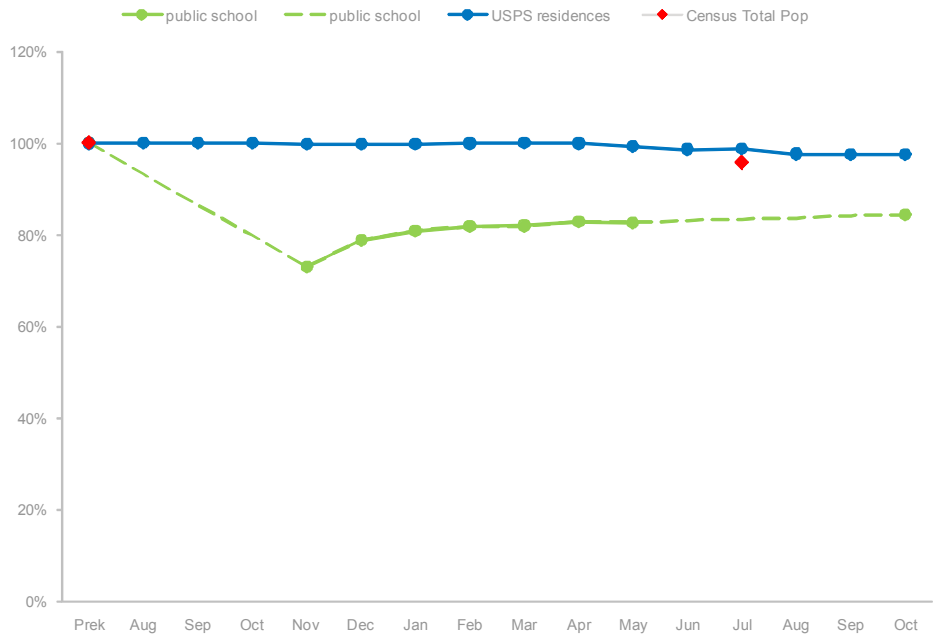
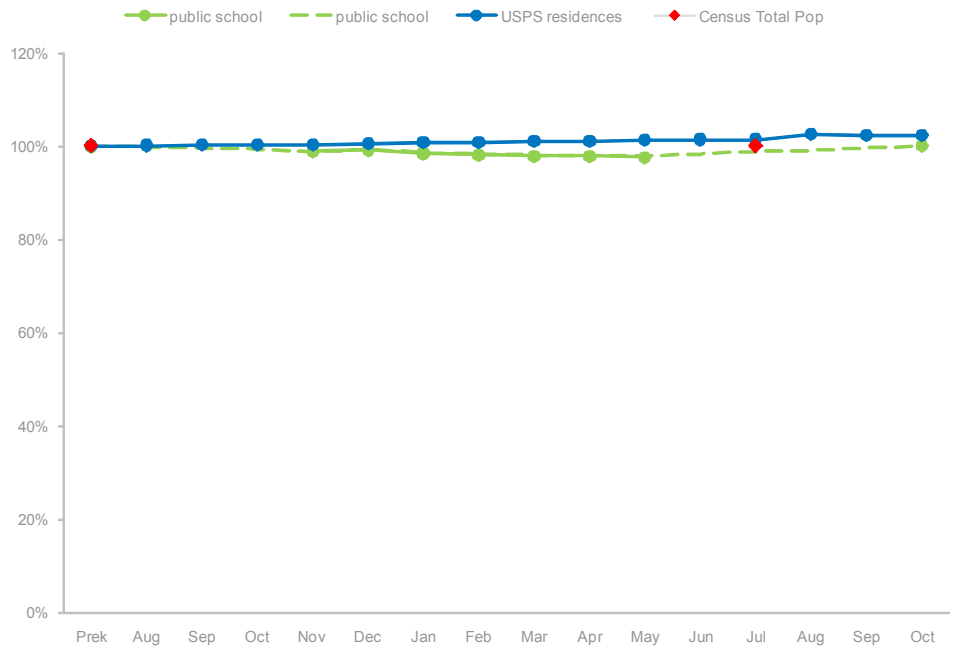


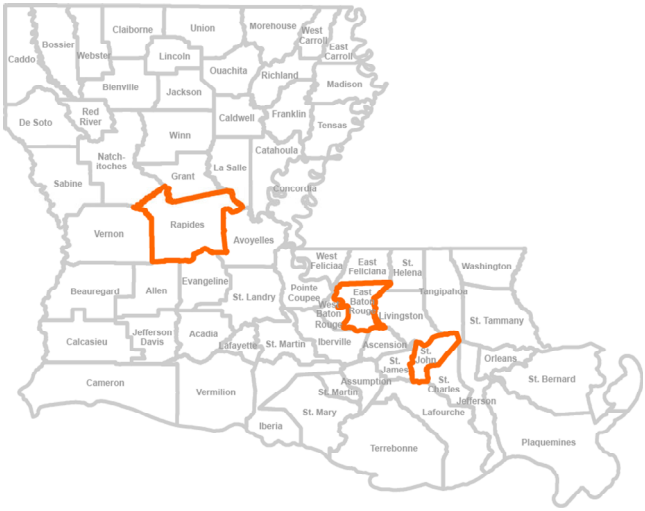
Figure 9: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates in Calcasieu Parish



Analyzing longer term trends in the data—parishes with a significant influx of evacuees

Of the eight parishes that experienced the largest increases in public school enrollment, we examined more closely three parishes in distinct parts of the state. East Baton Rouge Parish is part of the Baton Rouge metropolitan statistical area. Rapides Parish makes up the Alexandria metropolitan statistical area. St. John the Baptist Parish is an outlying suburban parish within the New Orleans metropolitan statistical area (See Map 1).

Map 1: East Baton Rouge, Rapides and St. John the Baptist Parishes



In both East Baton Rouge and St John the Baptist, school enrollment data more closely matched the census population estimates. In Rapides Parish, the census estimate indicator is slightly closer to the USPS population indicator. However, in all three parishes, the growth rate in the USPS data trailed the growth rates in the other two population indicators (See Figures 10, 11, and 12). These trends suggest that USPS counts of active addresses may not fully reflect the large and sudden population increases that occur in destination counties following large scale population displacements, even many months after the arrival of the evacuees, but instead reflect the growth in households in each parish.

Figure 10: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates in East Baton Rouge Parish

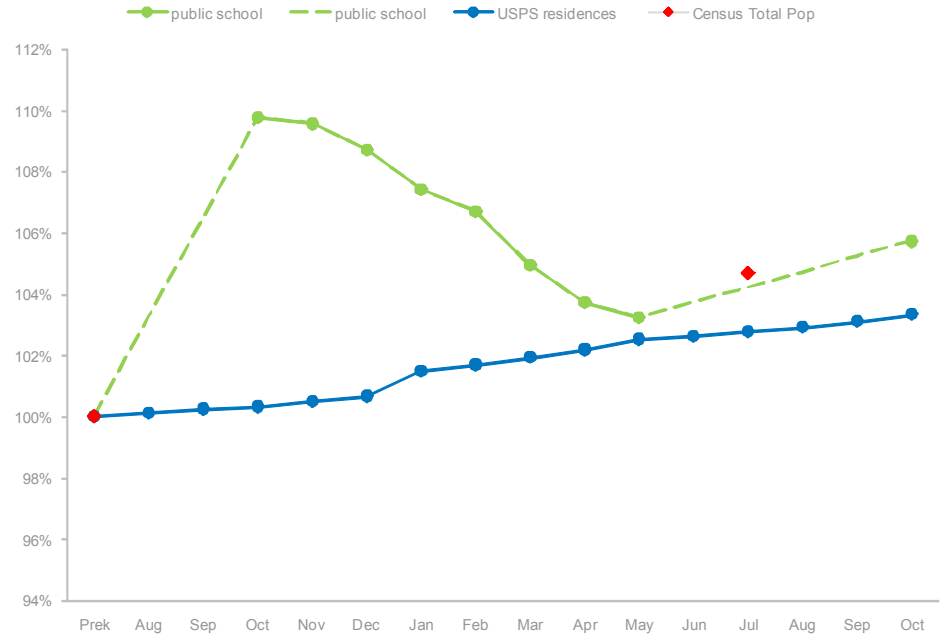


Figure 11: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates in St. John the Baptist Parish

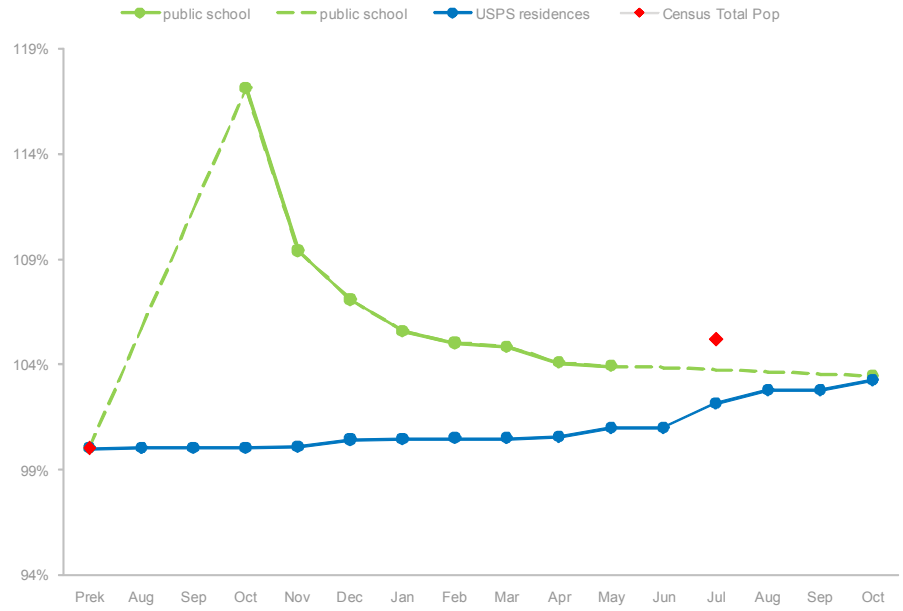
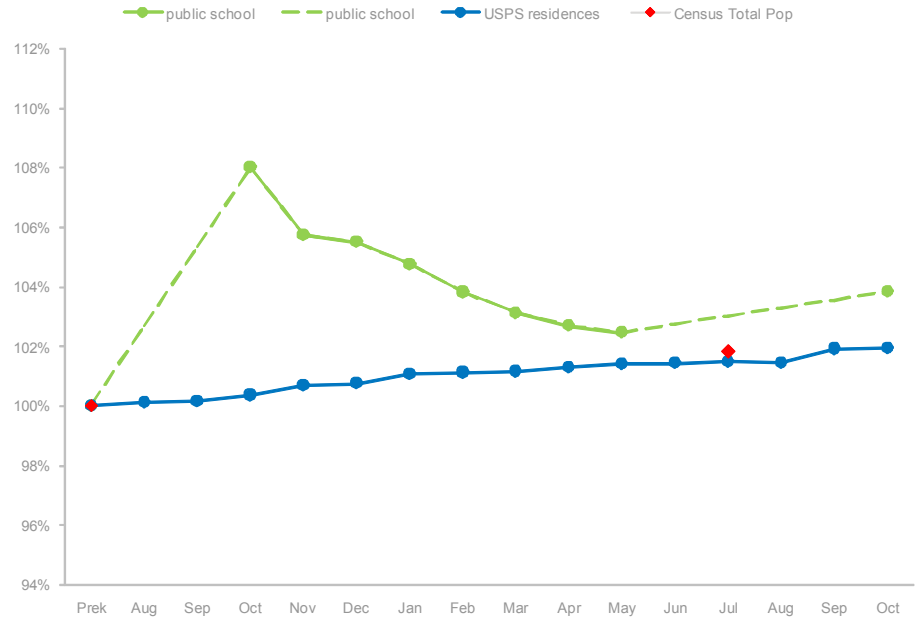


Figure 12: Percent of pre-hurricane public school enrollment, USPS counts and Census estimates in Rapides Parish



Conclusions

In normal times, USPS address counts are but one of many sources for creating population estimates, and may add little over simple projections of the Census Bureau's county population estimates to current dates. But in extraordinary times after dramatic population displacements, USPS data may be one of few options for developing county population estimates. In Louisiana parishes hit hardest by Hurricanes Katrina and Rita, the drop in population and housing was reflected in USPS address counts only after a few months, and the counts have since tracked recovery toward pre-hurricane numbers. An exception seems to be small rural parishes, where trends in USPS address counts do not conform as well to impact-recovery scenarios. It is also apparent that USPS counts do not reflect the increase in population in parishes that received large numbers of evacuees. This is likely because these sudden population increases were not accompanied by increases in addresses, or occupied housing units. USPS counts may have correctly reflected the lack of housing growth, but leave us looking for other resources to estimate the increase in persons per household and persons in group quarters that may be the basis for population growth in such areas.

The release of the Census Bureau's 2007 county population estimates will provide a new opportunity to see how USPS data perform relative to independent population estimates for the hurricane impacted parishes. The 2010 census will provide the next true indication of the accuracy of the USPS-based estimates in these parishes, but by then the most severe impacts will have dissipated. Uncertainty over post-catastrophe population estimates will persist, but it is clear that, even with their limitations, USPS address counts can be a valuable resource in tracking population trends in extreme circumstances.

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