

Special Processing Procedures for the Areas Affected by Hurricanes Katrina and Rita (Vintage 2009): April 1, 2000 to July 1, 2009

The Federal Emergency Management Agency (FEMA) declared 117 counties as disaster areas in Alabama, Louisiana, Mississippi, and Texas, as a result of hurricanes Katrina and Rita in August and September, respectively, of 2005. The U.S. Census Bureau employed adjustments for processing input data to accommodate geographic shifts of the population resulting from the hurricanes. The procedures employed for the 2006-2009 estimates are outlined below.

Domestic Migration (Household Population)

Population Under Age 65

Vintage 2006 Estimates

Domestic migration of the under age 65 household population is measured using address data from Federal income tax returns supplied by the Internal Revenue Service (IRS). However, the income tax return rates for residents of the disaster areas fell significantly in 2006 as a result of resident dislocations and automatic IRS-approved filing extensions. With these reductions in filing, we expected the year-to-year match rates of IRS data to erode, thereby reducing the accuracy of estimates of domestic migration for the population under age 65. After detailed analysis of the tax filer data, the Census Bureau decided to supplement the tax address data with additional, alternative administrative data for 62 parishes and counties.¹ The Census Bureau supplemented the IRS data with data from the U.S. Postal Services' National Change of Address (NCOA) file, using records processed through the end of June 2006. This supplemental data boosted coverage rates and, therefore, enhanced the accuracy of migration estimates compared to those derived from IRS data alone and enabled us to measure as much of the movement of the population as possible up to the July 1, 2006 estimate date.

Vintage 2007 Estimates

In preparing the migration data to support the July 1, 2007 estimates, we retained the supplemental NCOA file addresses that had been combined with IRS addresses as first year addresses, in order to measure migration flows from 2006 to 2007; all addresses in the second year of the matched record sets were IRS addresses. This essentially meant that we were returning the measurement of domestic migration flows for the under age 65 population in the second year to be based upon IRS data alone.

Vintage 2008 and Vintage 2009 Estimates

In 2008 and 2009 we resumed standard procedures to use IRS data to estimate migration of the population under age 65.

Population Aged 65 and Older

Vintage 2006 Estimates

Internal migration of the household population aged 65 and older is measured using aggregate Medicare data provided by the Centers for Medicare and Medicaid Services (CMS). The data we receive from CMS every year contain a one-year lag. We calculated numeric change for the previous two years of CMS data (July 1, 2004 and July 1, 2005) and added this change to the July 1, 2005 CMS data to estimate the enrollment as of July 1, 2006.

However, this standard procedure did not reflect the extraordinary impact of the hurricanes on the population, therefore, we developed a process to estimate out-migration of this age group for the 62 parishes and counties identified above (see endnote 1). We revised the Medicare enrollment figures to reflect out-migrant data measured from special tabulations of exemptions for the population aged 65 and older from the IRS data that had been enhanced by the NCOA address information described above. The result was a redistribution of out-migrant enrollees from these parishes and counties to other counties nationwide as indicated by the IRS/NCOA data. The final Medicare enrollment data were then used as inputs into the estimates process.

Vintage 2007 Estimates

We repeated the process of estimating the latest year's Medicare enrollment for the July 1, 2007 estimates except that we also allowed for the migration of people back into the 62 counties and parishes that had been specially processed for the 2006 estimates. The Medicare enrollment figures were modified to reflect 2006-2007 in-migrant and out-migrant data as measured from special tabulations of exemptions for the population aged 65 and older from the IRS/NCOA address information.

Vintage 2008 Estimates

We maintained the adjustment described above to 2006 and 2007 for the counties and parishes that had been specially processed for the 2006 estimates. For the 2008 estimates we held constant the numeric change between the two previous years (July 1, 2006 and July 1, 2007) and added this change to the July 1, 2007 data to estimate the enrollment as of July 1, 2008.

Vintage 2009 Estimates

We removed the adjustments for 2006 through 2008 from the Vintage 2009 estimates process because newly updated Medicare data provided for use in the 2009 estimates now reflected the impact of the hurricanes on these earlier years and we were able to apply them during development of the Vintage 2009 county and parish estimates.²

Group Quarters Population

Our standard method for producing estimates of the group quarters (GQ) population relies heavily on group quarters facility-level population provided to us by state members of the

Federal-State Cooperative for Population Estimates (FSCPE). The data are often lagged by a year due to the timing of the data collection. When data for a group quarters facility are not updated by the FSCPE member for a particular year, we assume that the population remains unchanged from the latest available data. For the places affected by the hurricanes, this assumption was no longer acceptable. When the FSCPE members were able to collect and submit current GQ populations for facilities in the damaged area, we utilized their data. For facilities with no updated information in the affected areas, we adjusted the GQ population based on housing unit damage and IRS tax return data.

We assumed that most of the damaged GQ facilities would be located in the counties/parishes with the most severe housing unit damage. Therefore, we first selected those counties/parishes with major or severe damage to 10 percent or more of their housing units due to these hurricanes (as defined by FEMA).³ Then we calculated a county GQ population adjustment factor for each selected county or parish by dividing the number of 2006 tax returns filed in each county or parish by the 2005 tax returns. We applied this factor to the July 1, 2005 GQ estimate for each subcounty area and GQ type within the county or parish, produced by the standard method, to calculate an adjusted July 1, 2006 GQ population estimate.

The procedure described above remained in effect for each subsequent year through the 2009 estimates.

Housing Unit Estimates

Vintage 2006 estimates

Counties. We identified 42 counties and parishes that sustained major or severe damage to more than two percent of their existing housing units according to FEMA.⁴ The components of housing change available to us for the estimates process did not reflect the housing situation after the hurricanes. Our best alternative was to use the change in the 2005-2006 household populations to estimate the 2006 habitable housing units. We estimated 2006 county and parish housing units in the affected areas by first calculating the ratio of the 2006 household population to the 2005 household population (vintage 2006 county population estimates) for each county and parish. We applied the household population ratio to the 2005 county housing unit estimate to produce the 2006 housing unit estimates.

Subcounty Areas. Reliable information was not available to measure the differential impact of the hurricanes on cities, towns, and unincorporated balances within the 37 counties and parishes with subcounty areas.⁵ Specifically, information on the number and distribution of demolished or uninhabitable units was not available and neither were alternative sources of information to estimate either the demolished units or the remaining habitable units. Therefore, the 2005-2006 rate of net housing change for each affected county or parish (using the 2006 estimates calculated as described above) was assumed to be constant for their constituent subcounty areas. The housing unit estimates for the cities and towns in the 37 parishes and counties were then produced, as follows:

- We calculated the ratio of the county- and parish-level 2006 housing unit estimates (revised for the hurricane impacts) to the 2005 county and parish housing unit estimates.
- The ratio for each county or parish was applied to their constituent subcounty areas' 2005 housing unit estimates to produce the 2006 subcounty housing unit estimates.

Vintage 2007 estimates

Counties. We used the 2006 revised population estimates (from the vintage 2007 estimates) to revise the 2006 housing unit estimates. We first calculated the ratio of the revised 2006 county household population to the 2005 county household population. We applied that ratio, by county and parish, to the 2005 county housing unit estimates to derive the revised 2006 housing unit estimates.

We produced the 2007 housing estimates for 40 of the original 42 counties and parishes by the standard housing estimates methodology, as these data tracked closely with the 2006-2007 household population change. However, we still identified two parishes (Orleans and St. Bernard) where the household population growth from 2006 to 2007 exceeded the preliminary estimated housing unit growth by more than five percentage points. The wide variance noted by review of the available data suggested that the household population growth in these two parishes was more indicative of housing changes than were the components of housing change. Specifically, the building permit data used to calculate the construction of new residential units were implausible measures for the conversion of units from uninhabitable to habitable status as well as tracking new construction. Therefore, we derived the 2007 housing unit estimates for Orleans and St. Bernard by computing and applying the ratio of their 2007 to 2005 estimated household populations (from the vintage 2007 estimates) to their 2005 housing estimates.

Subcounty Areas. For the 37 counties and parishes, we produced subcounty housing estimates for their respective cities and towns, as follows:

- We used the revised county- and parish-level 2005 and 2006 housing unit estimates (from vintage 2007) to recalculate the 2006 subcounty housing unit estimates, using the same procedure described in the subcounty section above.
- We then added the 2006-2007 subcounty components of housing change to these 2006 subcounty estimates to produce the 2007 housing unit estimates.

Vintage 2008 Estimates

Counties. We resumed the standard component-based procedures for estimating the number of housing units for counties and parishes.

Subcounty Areas. We resumed the standard component-based procedures for the subcounty areas, with the exception of four incorporated places on the coastline of Mississippi: Waveland and Bay St. Louis in Hancock County and Pass Christian and Long Beach in Harrison County.

We developed an alternative estimate by contacting each city and obtaining active utility connection data. For Bay St. Louis we were able to obtain data for 2006 to 2008, while for the other three cities we were able to obtain data for 2008. We applied the utility connection data to estimate the number of housing units for these places from 2006 through 2008, as described below.

To estimate the number of housing units, we divided the number of active utility connections for 2008 by the Census 2000 occupancy rate. To calculate the housing unit estimates for 2006 and 2007 (for those places where we only had one year of utility connection data), we subtracted the number of building permits (multiplied by a completion factor of .98), and mobile homes, and added the estimate of housing unit loss used to calculate the original 2008 estimate. For Bay St. Louis, where we had utility connection data for three years, we applied the same method that we used to calculate the 2008 estimate of housing units.

Bay St. Louis city also conducted a large annexation in 2006, which appeared in our estimates base for the first time in the vintage 2008 estimates. The city did not have utility connection data for the units in the annexed area but was able to provide us with a count of the units in the annexed area for 2006-2008, which we then combined with the utility data.

Vintage 2009 Estimates

Counties. Housing unit estimates in Orleans and St. Bernard parishes were derived by calculating the 2005 housing unit to household population ratios using vintage 2009 population estimates. These ratios were applied to the vintage 2009 household population for each year from 2007 through 2009 to arrive at the housing unit estimates.

Subcounty Areas. We resumed the standard component-based housing unit estimate procedure for Waveland, Bay St. Louis, Pass Christian, and Long Beach in Mississippi. In these cities, completed permits, mobile placement estimates, and non-permitted construction were added, and estimated housing unit loss was subtracted from the 2008 estimate to arrive at the 2009 housing unit estimate.

Subcounty Population

Vintage 2006 and Vintage 2007 Estimates

The vintage 2006 and 2007 housing unit estimates resulting from the special procedures described above were used to calculate the corresponding 2006 and 2007 subcounty population estimates within the 37 counties and parishes with subcounty areas. The procedure for calculating the population estimates based on intra-county housing unit distributions remained consistent across vintages. No additional data documenting the redistribution of population due to the hurricanes at the subcounty level for the 2006 and 2007 estimates were used.

The Census Bureau did not release vintage 2006 or vintage 2007 population estimates for four cities in coastal Mississippi that had experienced extensive damage (Waveland and Bay St. Louis

in Hancock County and Pass Christian and Long Beach in Harrison County). While we determined that these cities had sustained population loss at a greater rate than the loss for Hancock or Harrison counties as a whole, we were unable to quantify the amount of loss with reliable data.

Vintage 2008 Estimates

For the vintage 2008 estimates we produced a complete set of population estimates for Waveland, Bay St. Louis, Pass Christian and Long Beach by using the housing unit estimates based on utility connection data that was described earlier in this document.

Vintage 2009 Estimates

We resumed the standard procedures for estimating all subcounty areas within the 37 counties and parishes that originally had been subject to our special estimating procedures.

¹ These counties and parishes are: in Alabama (Baldwin, Marengo, Mobile); in Louisiana (Acadia, Ascension, Assumption, Beauregard, Calcasieu, Cameron, East Baton Rouge, East Feliciana, Iberia, Iberville, Jefferson, Lafayette, Lafourche, Livingston, Orleans, Plaquemines, Sabine, St. Bernard, St. Charles, St. Helena, St. James, St. John the Baptist, St. Tammany, Tangipahoa, Terrebonne, Vermilion, Washington, West Baton Rouge, West Feliciana); in Mississippi (Adams, Copiah, Covington, Forrest, George, Hancock, Harrison, Jackson, Jefferson Davis, Jones, Lamar, Lauderdale, Leake, Madison, Marion, Newton, Pearl River, Perry, Rankin, Smith, Stone, Wayne); and in Texas (Galveston, Hardin, Jasper, Jefferson, Newton, Orange, Polk, San Augustine).

² For more information on the removal of adjustments to the data used to estimate domestic migration of the population aged 65 and older, see www.census.gov/popest/topics/methodology/2009-est-relnotes.pdf.

³ These counties and parishes are: in Louisiana (Cameron, Jefferson, Orleans, Plaquemines, St. Bernard, St. Tammany, Vermilion); and in Mississippi (Hancock, Harrison, Jackson, and Stone).

⁴ These counties and parishes are: in Alabama (Mobile); in Louisiana (Acadia, Allen, Beauregard, Calcasieu, Cameron, Iberia, Jefferson, Jefferson Davis, Orleans, Plaquemines, St. Bernard, St. Charles, St. Helena, St. Tammany, Tangipahoa, Terrebonne, Vermilion, Washington); in Mississippi (Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jasper, Jones, Lamar, Lawrence, Marion, Pearl River, Perry, Stone, Walthall, Wayne); and in Texas (Hardin, Jasper, Jefferson, Newton, Orange, Tyler).

⁵ Of the 42 counties and parishes, Cameron, Plaquemines, St. Bernard and St. Charles Parishes contain no subcounty areas and Orleans Parish and the City of New Orleans are coextensive.