Projections of Florida Population by County, 2020–2045, with Estimates for 2016

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The Bureau of Economic and Business Research (BEBR) has been making population projections for Florida and its counties since the 1970s. This report presents our most recent set of projections and describes the methodology used to construct those projections. To account for uncertainty regarding future population growth, we publish three series of projections. We believe the medium series is the most likely to provide accurate forecasts in most circumstances, but the low and high series provide an indication of the uncertainty surrounding the medium series. It should be noted that these projections refer solely to permanent residents of Florida; they do not include tourists or seasonal residents.

State projections

The starting point for the state-level projections was the April 1, 2010 census population count by age, sex, race, and Hispanic origin, as adjusted by the National Center for Health Statistics (NCHS) in the Vintage 2014 bridged race population estimates. Projections were made in one-year intervals using a cohort-component methodology in which births, deaths, and migration are projected separately for each age-sex cohort in Florida for non-Hispanic whites, non-Hispanic nonwhites, and Hispanics. We applied three different sets of assumptions to provide low, medium, and high series of projections. Although the low and high series do not provide absolute bounds on future population change, they provide a reasonable range in which Florida's future population is likely to fall.

Survival rates were applied by single year of age, sex, race, and Hispanic origin to project future deaths in the population. These rates were based on Florida Life Tables for 2007–2013, using mortality data published by the Office of Vital Statistics in the Florida Department of Health. The survival rates were adjusted upward each year until 2044 to account for projected increases in life expectancy. These adjustments were based on projected increases in survival rates released by the U.S. Census Bureau. We used the same mortality assumptions for all three series of projections because there is less uncertainty regarding future changes in mortality rates than is true for migration and fertility rates.

Domestic migration rates by age and sex were based on Public Use Microdata Sample (PUMS) files from the 2005–2009 and 2011–2015 American Community Survey (ACS) 5-year estimates. We chose an average of those two sets of migration estimates because the recession of 2007–2009 had a substantial impact on migration patterns in Florida, affecting in- and out-migration in both time periods; in addition, projections based on more than one time period tend to be more accurate than those based on a single time period. The 2005–2009 data are the earliest ACS 5-year migration estimates that are available, and the 2011–2015 data are the most recent.

For all three racial/ethnic groups, we applied smoothing techniques to the age/sex-specific migration rates to adjust for data irregularities caused by small sample size. The smoothed in- and out-migration rates were weighted to account for recent changes in Florida's population growth rates. Projections of domestic in-migration were made by applying weighted in-migration rates to the projected population of the United States (minus Florida), using the most recent set of national projections produced by the U.S.

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Census Bureau. Projections of out-migration were made by applying weighted out-migration rates to the Florida population. In both instances, rates were calculated separately for males and females by race and ethnicity for each age up to 90+.

For the medium projection series, in-migration weights for non-Hispanic whites varied from 1.14 to 1.05, and out-migration weights varied from 0.97 to 0.95. For non-Hispanic nonwhites, in-migration weights varied from 1.10 to 1.05, and out-migration weights varied from 0.97 to 0.95. For Hispanics, in-migration weights varied from 1.09 to 1.05, and out-migration weights varied from 0.97 to 0.95. For the low projection series, the in-migration weights described above were lowered for all three racial/ethnic groups over time – from 5% in 2016–2020 to 11% in 2040–2045; the out-migration weights were raised by the same margins. For the high projection series, the in-migration weights described above were raised for all three racial/ethnic groups over time – from 5% in 2016–2020 to 11% in 2040–2045; the out-migration weights were lowered by the same margins.

The distribution of foreign immigrants for the three racial/ethnic groups by age and sex was also based on an average of the patterns observed for 2005–2009 and 2011–2015. Again, we smoothed the estimates to account for irregularities in age/sex distribution of immigrants. For the medium projection series, we held foreign immigration at an average of the 2005–2009 and 2011–2015 levels; we also made minor adjustments to the racial/ethnic distribution of those migrants based on recent trends. For the low series, foreign immigration was projected to decrease by an additional 1,000 per year from the average of the 2005–2009 and 2011–2015 levels; for the high series, foreign immigration was projected to increase by an additional 1,000 per year. Foreign emigration was assumed to equal 25% of foreign immigration for each series of projections.

Projections were made in one-year intervals, with each projection serving as the base for the following projection. Projected in-migration for each one-year interval was added to the survived Florida population at the end of the interval and projected out-migration was subtracted, giving a projection of the population age one and older. Births were projected by applying age-specific birth rates (adjusted for child mortality) to the projected female population of each race/ethnicity group. These birth rates were based on Florida birth data for 2007–2013 published by the Office of Vital Statistics in the Florida Department of Health. They imply a total fertility rate (TFR) of 1.66 births per woman for non-Hispanic whites, 2.08 births per woman for non-Hispanic nonwhites, 1.92 births per woman for Hispanics, and 1.83 births per woman for total population. These rates were adjusted in the short-term projections to make them consistent with recent fertility trends. We also raised them long-term since the age-specific fertility rates calculated using the 2007–2013 birth data were lower than they had been in the past due to the recession. By 2025, these rates imply a total fertility rate of 1.74 births per woman for non-Hispanic whites, 2.19 births per woman for non-Hispanic nonwhites, 2.05 births per woman for Hispanics, and 1.92 births per woman for total population.

As a final step, projections for non-Hispanic whites, non-Hispanic nonwhites, and Hispanics were added together to provide projections of the total population. The medium projections of total population for 2017–2021 were adjusted to be consistent with the state population forecasts for those years produced by the State of Florida's Demographic Estimating Conference (DEC) held February 13, 2017. None of the projections after 2021 had any further adjustments. In this publication, we provide projections for 2020, 2025, 2030, 2035, 2040, and 2045. State projections for other years are available by request.

County projections

The cohort-component method is a good way to make population projections at the state level, but is not necessarily the best way to make projections at the county level. Many counties in Florida are so small that the number of persons in each age-sex category is inadequate for making reliable cohort-component projections, given the lack of detailed small-area data. Even more important, county growth patterns are so volatile that a single technique based on data from a single time period may provide misleading results. We believe more useful projections of total population can be made by using several different techniques and historical base periods.

For counties, we started with the population estimate constructed by BEBR for April 1, 2016. We made projections for each county using four different techniques. After 2020, the projections were made in five-year increments. The four techniques were:

1. Linear – the population will change by the same number of persons in each future year as the average annual change during the base period.
2. Exponential – the population will change at the same percentage rate in each future year as the average annual rate during the base period.
3. Share-of-growth – each county's share of state population growth in the future will be the same as its share during the base period.
4. Shift-share – each county's share of the state population will change by the same annual amount in the future as the average annual change during the base period.

We produced two sets of projections for each county for each projection year (2020, 2025, 2030, 2035, 2040 and 2045). For the first set, we used the same set of techniques and base period lengths as last year: base periods of five, ten, and fifteen years (2011–2016, 2006–2016, and 2001–2016) for the linear and share-of-growth techniques, yielding three sets of projections for each technique; and base periods of ten and twenty years (2006–2016 and 1996–2016) for the exponential and shift-share techniques, yielding two sets of projections for each technique. From these ten projections, we calculated four averages: one using all ten projections (AVE-10), one that excluded the highest and lowest projections (AVE-8), one that excluded the two highest and two lowest projections (AVE-6), and one that excluded the three highest and three lowest projections (AVE-4).

Based on results from our ongoing projection evaluation research, this year we also created a second set of projections, for which we used a different combination of base period lengths for the same four projection techniques: base periods of two, ten, and twenty years (2014–2016, 2006–2016, and 1996–2016) for the linear and share-of-growth techniques, yielding three sets of projections for each technique; and base periods of five and fifteen years (2011–2016 and 2001–2016) for the exponential and shift-share techniques, yielding two sets of projections for each technique. Similar to the first set, we again calculated four averages from these ten projections (AVE-10, AVE-8, AVE-6, and AVE-4).

We believe the combination of base period lengths and projection techniques in the second set to be preferable to those of the first set. The second set introduces, for the first time, the usage of very short base periods (two years), which – when combined with longer base periods – can improve forecast accuracy, especially for shorter term projections. The second set provides two projections for each base period length (2, 5, 10, 15, and 20 years), whereas the first set puts more emphasis on 10-year changes. Finally, the second set extends the range of base data used for the linear and share-of-growth techniques (from 5, 10, and 15 years to 2, 10, and 20 years), while still keeping the base data used for the exponential and shift-share techniques ten years apart (5 and 15 years, versus 10 and 20 years in the first set). The number of projections for each technique (three for linear and share-of-growth, and two for exponential and shift-share) is the same in both sets.

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To provide for greater continuity with our previous county projections, we decided to average projections from the first and second set. We chose AVE-4 as the default technique for each county in each set, and then averaged those two averages. We then evaluated the resulting projections by comparing them with historical population trends and with the level of population growth projected for the state as a whole. For counties in which the average of AVE-4 from the two sets did not provide reasonable projections, we selected the technique producing projections that fit most closely with our evaluation criteria. For 59 counties we selected the default technique. For Brevard, Flagler, Lee, Osceola, Pinellas, St. Lucie, and Sarasota counties, we selected AVE-4 from the first set of projections; for Putnam County, we selected an average of projections made with the share-of-growth technique with base periods of five and fifteen years. Projections for all counties were adjusted to make projected changes for counties consistent with the total population change implied by the state projections.

We also made adjustments in several counties to account for changes in institutional populations such as university students and prison inmates. Adjustments were made only in counties in which institutional populations account for a large proportion of total population or where changes in the institutional population have been substantially different than changes in the rest of the population. In the present set of projections, adjustments were made for Alachua, Baker, Bradford, Calhoun, Columbia, DeSoto, Dixie, Franklin, Gadsden, Gilchrist, Glades, Gulf, Hamilton, Hardee, Hendry, Holmes, Jackson, Jefferson, Lafayette, Leon, Liberty, Madison, Okeechobee, Santa Rosa, Sumter, Suwannee, Taylor, Union, Wakulla, Walton, and Washington counties.

Range of county projections

The techniques described in the previous section were used to construct the medium series of county projections. This is the series we believe will generally provide the most accurate forecasts of future population change. We also constructed low and high projections to provide an indication of the uncertainty surrounding the medium county projections. The low and high projections were based on analyses of past population forecast errors for counties in Florida, broken down by population size and growth rate. They indicate the range into which approximately three-quarters of future county populations will fall, if the future distribution of forecast errors is similar to the past distribution.

The range between the low and high projections varies according to a county's population size in 2016 (less than 30,000; 30,000 to 199,999; and 200,000 or more), rate of population growth between 2006 and 2016 (less than 7.5%; 7.5–15%; 15–30%; and 30% or more), and the length of the projection horizon (on average, projection errors grow with the length of the projection horizon). Our studies have found that the distribution of absolute percent errors tends to remain fairly stable over time, leading us to believe that the low and high projections provide a reasonable range of errors for most counties. It must be emphasized, however, that the actual future population of any given county could be above the high projection or below the low projection.

For the medium series of projections, the sum of the county projections equals the state projection for each year (except for slight differences due to rounding). For the low and high series, however, the sum of the county projections does not equal the state projection. The sum of the low projections for counties is lower than the state's low projection and the sum of the high projections for counties is higher than the state's high projection. This occurs because potential variation around the medium projection is greater for counties than for the state as a whole.

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