

Projections of the Total Population for Florida and its Counties

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State projections

The starting point for the state-level projections was the 2010 census count by age and sex as reported by the U.S. Census Bureau. Projections were made in five-year intervals using a cohort-component methodology in which births, deaths, and migration were projected separately for each age/sex group. 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 growth, they offer a reasonable range in which Florida's future population is likely to fall.

Survival rates were applied to each age/sex group to project future deaths in the population. These rates were based on Florida Life Tables for 2009–2011, using mortality data published by the Office of Vital Statistics in the Florida Department of Health. The survival rates were adjusted upward in 2020, 2025, 2030, 2035, and 2040 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 much 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 data from Public Use Microdata Sample (PUMS) files from the 2009–2013 American Community Survey (ACS). Since migration estimates from the ACS cover a one-year period, we developed a methodology for converting one-year data into five-year data. Using PUMS files, IRS migration records, and 1990 and 2000 census data, we developed a set of conversion factors and applied them to the 2009–2013 PUMS data. The conversion process raised the one-year migration estimates by a factor of 3.4 for in-migration and by 3.0 for out-migration. We calculated in-migration rates by dividing the number of persons moving to Florida from other states by the 2011 population of the United States (minus Florida) and calculated out-migration rates by dividing the number of persons leaving Florida by Florida's 2011 population. In both instances, rates were calculated separately for males and females for each five-year age group up to 85+.

These in- and out-migration rates were weighted to account for recent changes in Florida's population growth rates and to provide alternative scenarios regarding future growth. For each of the three series, 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. Census Bureau. Projections of out-migration were made by applying weighted out-migration rates to the Florida population.

For the medium projection series, the in-migration weights were 1.17 for 2015–2020, 1.12 for 2020–2025, 1.09 for 2025–2030, and 1.08 thereafter; the out-migration weight was 0.92 for each projection interval. For the high series, the in-migration weights were 1.41 for 2015–2020, 1.25 for 2020–2025, and 1.2 thereafter; the out-migration weight was 0.8 for each projection interval. For the low projection series, the in-migration weight was 0.94 for each projection interval, while the out-migration weight was 1.05 for each projection interval.

Projections of foreign immigration were also based on data from the 2009–2013 PUMS files. We converted one-year migration data to five-year data by multiplying them by 4.2. For the medium projection series, foreign immigration was projected to be 25,000 above the 2009–2013 level in 2015–2020; it was raised by an additional 25,000 in each projection interval thereafter. For the high series, foreign immigration was projected to be 50,000 above the 2009–2013 level in 2015–2020; it was raised by an additional 50,000 in each projection interval thereafter. For the low series, foreign immigration was projected to remain at the 2009–2013 level in each projection interval. Foreign emigration was assumed to equal 22.5% of foreign immigration for each series of projections. The distribution of foreign immigrants by age and sex was based on the patterns observed between 2009 and 2013.

Extracted from Florida Population Studies, Bureau of Economic and Business Research, University of Florida, *“Projections of Florida Population by County, 2020-2045, with Estimates for 2015”*, Volume 49, Bulletin 174, January 2016.

Projections were made in five-year intervals, with each projection serving as the base for the following projection. Projected in-migration for each five-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 five and older. Births were projected by applying age-specific birth rates to the projected female population by age, and the population less than age five was projected by summing births over a five-year period and adjusting for child mortality. The underlying birth rates were based on Florida birth data for 2009–2011 and imply a total fertility rate of 1.9 births per woman. These rates were adjusted to make them consistent with recent trends. For all three projection series, birth rates were reduced by 3.5% from 2009–2011 levels for 2015–2020, by 2% for 2020–25, and by 0.5% for 2025–2030; they were held at 2009–2011 levels thereafter.

As a final step, the medium projection of total population in 2020 was adjusted to be consistent with the state population forecast for 2020 produced by the State of Florida’s Demographic Estimating Conference held December 1, 2015. None of the projections after 2020 had any further adjustments.

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, 2015. We made projections for each county in five-year increments using four different techniques:

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.

For the linear and share-of-growth techniques we used base periods of five, ten, and fifteen years (2010–2015, 2005–2015, and 2000–2015), yielding three sets of projections for each technique. For the exponential and shift-share techniques we used base periods of ten and twenty years (2005–2015 and 1995–2015), yielding two sets of projections for each technique.

This methodology produced ten projections for each county for each projection year (2020, 2025, 2030, 2035, 2040 and 2045). From these, we calculated four averages: one using all ten projections, one that excluded the highest and lowest projections, one that excluded the two highest and two lowest projections, and one that excluded the three highest and three lowest projections. Based on the results of previous research, we designated the last of the four averages (AVE-4) as the default technique for each county. We 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 AVE-4 did not provide reasonable projections, we selected the technique producing projections that fit most closely with our evaluation criteria.

For 64 counties we selected AVE-4, the average in which the three highest and three lowest projections were excluded. For Monroe County, we selected an average of projections made with the share-of-growth technique

with a base period of five years and the exponential technique with a base period of twenty years; for Putnam County, we selected an average of projections made with the exponential technique with base periods of ten and twenty years; and for Sumter County, we selected the linear technique with a base period of ten 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, 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 above 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 2015 (less than 30,000; 30,000 to 199,999; and 200,000 or more), rate of population growth between 2005 and 2015 (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.