

# Population Change in the West

Data Sources and Methods

December, 2014



This document describes the data sources and methods used to generate the interactive data tool, [Migration and Population Trends in the West Vary by County Type](#). We also explain the theory behind the composition of these typologies. The typologies are assembled with the intent of capturing the most important, defining characteristics of counties with a large high-wage service sector, farming sector, or oil and natural gas sector, or that are retirement destinations. These categories are not exclusive; in fact, many counties contain some elements of each typology. The typologies are also not exhaustive and there are likely other ways to define differences between counties. The typologies presented in this interactive tool can be combined to help tell the complex story of why population is changing across the West. Scroll across each county to see how each is a mix of different typologies (red dots to the left indicate “less like” while to the right indicate “more like”).

## ***Population Data: Net Migration and Natural Change***

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***Methods:*** Net migration (in-migration minus out-migration) per 1000 people and net natural change (births minus deaths) per 1000 people were obtained for each year from 2003 through the latest year available, 2012. The average rates were calculated for a five year period (2008-2012) and a ten year period (2003-2012). The averages were calculated for all years excluding 2010 because the Census Bureau data for net migration and natural change cover only January through March during decennial years.

***Data Source:*** U.S. Department of Commerce. Census Bureau, Population Division, Washington, D.C.

## ***High-Wage Services Typology***

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The high-wage services typology is composed of measures of the growth and size of employment in high-wage service sectors, and characteristics of the workforce that is employed in these sectors. Economies that specialize in high-wage services have a high demand for a well-educated workforce. Because many of these high-wage sectors are relatively new, employees in these sectors are likely to be young and have young families. These sectors are growing steadily, with relatively little volatility, which translates into steady personal income over time. Finally, while high-wage services can flourish away from metro areas, their workers need to be able to connect to broader markets, which we capture in proximity to airports.

The "High-wage Services Score" for a county equals the number of criteria satisfied. The criteria are as follows:

#### GAIN IN HIGH-WAGE SERVICE JOBS IN 75<sup>TH</sup> PERCENTILE (2003-2012)

Methods: This criterion is met if employment growth in high-wage services from 2003-2012 was in the 75<sup>th</sup> percentile among western counties. The following list of NAICS codes are considered to be high-wage services:

- 221 Utilities
- 423 Merchant wholesalers, durable goods
- 425 Electronic markets and agents and brokers
- 483 Water transportation
- 486 Pipeline transportation
- 511 Publishing industries, except Internet
- 512 Motion picture and sound recording industries
- 515 Broadcasting, except Internet
- 517 Telecommunications
- 518 Data processing, hosting and related services
- 519 Other information services
- 521 Monetary authorities - central bank
- 523 Securities, commodity contracts, investments
- 524 Insurance carriers and related activities
- 525 Funds, trusts, and other financial vehicles
- 533 Lessors of nonfinancial intangible assets
- 541 Professional and Technical Services
- 551 Management of companies and enterprises
- 711 Performing arts and spectator sports

Data Source: U.S. Department of Commerce. Census Bureau, County Business Patterns, Washington, D.C.

#### PERCENT OF JOBS IN HIGH-WAGE SERVICES IN 75<sup>TH</sup> PERCENTILE (2003-2012)

Methods: This criterion is met if the average share of employment in high-wage services from 2003-2012 was in the 75<sup>th</sup> percentile among western counties.

Data Source: U.S. Department of Commerce. Census Bureau, County Business Patterns, Washington, D.C.

#### PERCENT OF PEOPLE WITH COLLEGE DEGREE IN 75<sup>TH</sup> PERCENTILE (2000-2012)

Methods: This criterion is met if growth in the percent of the population of working age (18 to 64 years of age) from 2000 to the 2008-2012 period was in the 75<sup>th</sup> percentile among western

counties. Due to the availability of age distribution data, we relied on the decennial census for the starting point and 5-year American Community Survey estimates for the end point.

Data Source: U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.

#### MEDIAN AGE LESS THAN 41 (2000-2012)

Methods: This criterion is met if the median age averaged less than 41 in 2000 and 2012.

Data Source: U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.

#### GAIN IN PEOPLE AGE 17 AND UNDER (2000-2012)

Methods: This criterion is met if growth in the number of people of age 17 and younger from 2000 to the 2008-2012 period was in the 75th percentile among western counties. Due to the availability of age distribution data, we relied on the decennial census for the starting point and 5-year American Community Survey estimates for the end point.

Data Source: U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.

#### WITHIN 1 HOUR OF A MAJOR AIRPORT (2012)

Methods: This criterion is based on GIS data and is met if the mean travel time to the nearest major airport is less than one hour. Details on calculating airport travel time are described here: [http://headwaterseconomics.org/3wests/Rasker\\_et\\_al\\_2009\\_Three\\_Wests.pdf](http://headwaterseconomics.org/3wests/Rasker_et_al_2009_Three_Wests.pdf).

Data Source: Rasker, R., P.H. Gude, J.A. Gude, J. van den Noort. 2009. The economic importance of air travel in high-amenity rural areas. *Journal of Rural Studies* 25(2009):343-353.

#### INCOME VOLATILITY IN 25TH PERCENTILE (2003-2012)

Methods: This criterion is met if volatility in personal income from 2003 to 2012 was low (in the 25th percentile among western counties). All sources of personal income were included with the exception of earnings from government jobs. Personal income volatility was calculated as the standard deviation of personal income from 2003 to 2012 divided by the absolute value of the mean.

Data Source: U.S. Department of Commerce. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

## ***Farm-Dependent Typology***

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The Farm-Dependent typology is based on employment and earnings from farming and county land use. Farm-dependent communities will have high earnings and employment in farming over time, but they will also have high farm earnings relative to other counties, indicating places with consistently successful operations. The land in these counties will be predominantly in farms, and we include an indicator for rural counties to focus on farm production, rather than farming-related services that would be provided in larger communities.

The "Farm-Dependent Score" for a county equals the number of criteria satisfied. The criteria are as follows:

### **FARM EMPLOYMENT IN 90TH PERCENTILE (2003-2012)**

Methods: This criterion is met if the average share of jobs in all forms of agricultural production, including livestock operations, from 2003 to 2012 was in the 90th percentile among western counties.

Data Source: U.S. Department of Commerce. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

### **FARM EARNINGS IN 90TH PERCENTILE (2003-2012)**

Methods: This criterion is met if the average share of earnings from all forms of agricultural production, including livestock operations, from 2003 to 2012 was in the 90th percentile among western counties.

Data Source: U.S. Department of Commerce. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

### **FARM EARNINGS ABOVE AVERAGE FOR 5+ YEARS (2003-2012)**

Methods: This criterion is met if the duration of above-average farm earnings exceeded five years. The duration was calculated as the count of years, from 2003 to 2012, in which the percent of earnings from farming in an individual county exceeded the annual average for the West (i.e., a count of years in which the location quotient value is greater than one).

Data Source: U.S. Department of Commerce. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

## PERCENT OF LAND IN FARMS IN 75TH PERCENTILE (2012)

Methods: This criterion is met if the percent of land in farms in 2012 was in the 75th percentile among western counties. Farms refer to all forms of agricultural production, including livestock operations. These data exclude leased public land from total land in farms.

Data Source: U.S. Department of Agriculture. National Agricultural Statistics Service, Census of Agriculture, Washington, D.C.

## MSA COUNTY TYPE IS RURAL (2013)

Methods: This criterion is met if the county is designated by the U.S. Census Bureau as “Rural.” All counties not designated as either Metropolitan or Micropolitan Statistical Areas are designated as Rural. The definitions for Metropolitan and Micropolitan Statistical Area Counties follow.

Metropolitan Statistical Areas: Counties that have at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. Metropolitan Statistical Areas are classified as either Central or Outlying.

Micropolitan Statistical Areas: Counties that have at least one urban cluster of at least 10,000 but less than 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. Micropolitan Statistical Areas are classified as either Central or Outlying.

Data Source: U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.

## *Oil and Natural Gas Boom Typology*

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The Oil and Natural Gas typology includes measures of whether oil and/or gas are produced in the county, the size of the oil and gas sector, and characteristics of its workforce. We include two measures for oil and gas production: whether the county is producing oil *or* natural gas, or oil *and* natural gas. Together these provide a measure of the intensity of production and depth of the sector. We include two measures for employment in the oil and gas sector: the proportion of a county’s employment in oil and gas and whether this proportion of employment is consistently high relative to other Western counties. Finally, to capture the high demand for workers in these communities, we include the growth in working-age adults.

The "Oil and Gas Score" for a county equals the number of criteria satisfied. The criteria are as follows:

#### PRODUCE EITHER OIL OR GAS (2000-2010)

Methods: This criterion is based on GIS data and is met if the county contains at least 10 square miles where the "2000s\_1sqmicg" field is attributed as either "contains at least one productive oil well, but no productive gas wells" or "contains at least one productive gas well, but no productive oil wells."

Data Source: U.S. Geological Survey. Oil and Gas Exploration and Production in the United States Shown as One-Mile Cells (Decadal Time Slices); See <http://energy.usgs.gov/OilGas/AssessmentsData/NationalOilGasAssessment.aspx> .

#### PRODUCE BOTH OIL AND GAS (2000-2010)

Methods: This criterion is met if the county contains at least 2 square miles where the "2000s\_1sqmicg" field is attributed as "contains at least one productive oil well and at least one productive gas well or one well producing both oil and gas."

Data Source: U.S. Geological Survey. Oil and Gas Exploration and Production in the United States Shown as One-Mile Cells (Decadal Time Slices); See <http://energy.usgs.gov/OilGas/AssessmentsData/NationalOilGasAssessment.aspx> .

#### OIL AND GAS EMPLOYMENT IN 90TH PERCENTILE (2003-2012)

Methods: This criterion is met if employment in oil and gas (NAICS 2111, 213111, 213112) during the past decade is in 90th percentile (greater than 2.4 percent).

Data Source: U.S. Department of Commerce. Census Bureau, County Business Patterns, Washington, D.C.

#### OIL AND GAS EMPLOYMENT ABOVE AVERAGE FOR 5+ YEARS (2003-2012)

Methods: This criterion is met if the duration of above average oil and gas employment (NAICS 2111, 213111, 213112) exceeded five years. The duration was calculated as the count of years, from 2003 to 2012, in which the percent of employment from oil and gas extraction in an individual county exceeded the annual average for the West (i.e., a count of years in which the location quotient value is greater than one).

Data Source: U.S. Department of Commerce. Census Bureau, County Business Patterns, Washington, D.C.

## GAIN IN WORKING AGE IN 75TH PERCENTILE (2000-2012)

**Methods:** This criterion is met if growth in the percent of the population of working age (18 to 64 years of age) from 2000 to the 2008-2012 period was in the 75th percentile among western counties. Due to the availability of age distribution data, we relied on the decennial census for the starting point and 5-year American Community Survey estimates for the end point.

**Data Source:** U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.

## Retirement Destination Typology

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Retirement destinations have a growing aging population, but this is due to an influx of retirees rather than a loss of younger residents. To capture this, the Retirement Destination typology is composed of measures of a county's aging population, as well as growth in other age cohorts. We measure the aging population in growth in the number of people over age 65, a high median age, and the proportion of all income from Medicare. We identify places appealing to youth and working-age residents as growing in all age cohorts, and with increasing median home prices.

The "Retirement Destination Score" for a county equals the number of criteria satisfied. The criteria are as follows:

## GAIN IN PEOPLE AGE 65 AND OVER IN 75TH PERCENTILE (2000-2012)

**Methods:** This criterion is met if growth in the number of people of age 65 and older from 2000 to the 2008-2012 period was in the 75th percentile among western counties. Due to the availability of age distribution data, we relied on the decennial census for the starting point and 5-year American Community Survey estimates for the end point.

**Data Source:** U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.

## MEDIAN AGE GREATER THAN 41 (2000-2012)

**Methods:** This criterion is met if the median age averaged 41 or older in 2000 and 2012.

Data Source: U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.

#### PERCENT OF INCOME FROM MEDICARE IN 75TH PERCENTILE (2003-2012)

Methods: This criterion is met if the percent of total personal income from Medicare from 2003 to 2012 was in the 75th percentile among western counties.

Data Source: U.S. Department of Commerce. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

#### GAIN IN ALL AGE COHORTS (< 18, 18-64, AND > 64) (2000-2012)

Methods: This criterion is met if each of three cohorts (< 18, 18-64, and > 64) experienced growth from 2000 to the 2008-2012 period. Due to the availability of age distribution data, we relied on the decennial census for the starting point and 5-year American Community Survey estimates for the end point.

Data Source: U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.

#### GAIN IN MEDIAN HOME PRICE IN 75TH PERCENTILE (2000-2012)

Methods: This criterion is met if growth in the median home price from 2000 to the 2008-2012 period was in the 75th percentile among western counties. Due to the availability of age distribution data, we relied on the decennial census for the starting point and 5-year American Community Survey estimates for the end point.

Data Source: U.S. Department of Commerce. Census Bureau, Systems Support Division, Washington, D.C.; U.S. Department of Commerce. Census Bureau, American Community Survey Office, Washington, D.C.