A Profile of Land Use

Selected Geographies

Selected Geographies:

New Mexico; McKinley County, NM; Cibola County, NM; San Juan County, NM

United States

Benchmark Geographies:

U.S.

Produced by
Headwaters Economics'
Economic Profile System (EPS)
https://headwaterseconomics.org/eps
August 19, 2024

About the Economic Profile System (EPS)

EPS is a free web tool created by Headwaters Economics to build customized socioeconomic reports of U.S. counties, states, and regions. Reports can be easily created to compare or aggregate different areas. EPS uses published statistics from federal data sources, including the U.S. Census Bureau, Bureau of Economic Analysis, and Bureau of Labor Statistics.

The Bureau of Land Management and Forest Service have made significant financial and intellectual contributions to the operation and content of EPS.

See https://headwaterseconomics.org/eps for more information about the capabilities of EPS. For technical questions, contact Patty Hernandez Gude at eps@headwaterseconomics.org or telephone 406-599-7425.

HEADWATERS ECONOMICS

headwaterseconomics.org

Headwaters Economics is an independent, nonprofit research group. Our mission is to improve community development and land management decisions.

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

www.blm.gov

The Bureau of Land Management, an agency within the U.S. Department of Interior, administers 249.8 million acres of America's public lands, located primarily in western states. It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

www.fs.fed.us

The Forest Service, an agency of the U.S. Department of Agriculture, administers national forests and grasslands encompassing 193 million acres. The Forest Service's mission is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.

Land Use

Selected Geographies

Table of Contents

Note to Users:

This is one of 14 reports that can be created and downloaded from EPS. Topics include land use, demographics, specific industry sectors, the role of non-labor income, the wildland-urban interface, the role of amenities in economic development, and payments to county governments from federal lands. The EPS reports are downloadable as Excel or PDF documents. See https://headwaterseconomics.org/eps.

Land Use

Selected Geographies

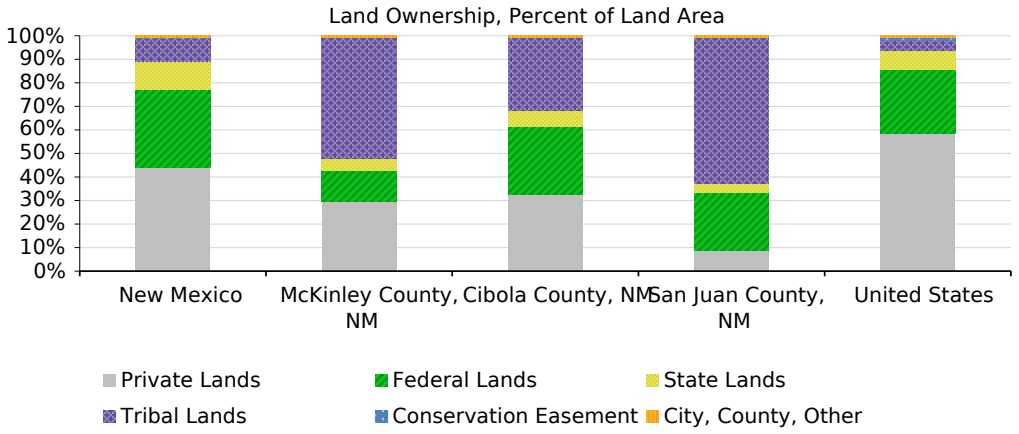
Land Ownership

	New Mexico	McKinley County, NM	Cibola County, NM	San Juan County, NM	United States
Total Acres*	77,726,645	3,490,137	2,906,398	3,533,626	2,255,912,699
Private Lands	34,538,278	1,032,215	949,415	306,596	1,339,427,106
Conservation Easement	919,833	3,154	5,300	77	31,813,835
Federal Lands	26,298,822	455,883	845,142	880,877	622,042,308
Forest Service	9,223,931	193,919	304,810	0	192,007,324
BLM	13,487,492	246,896	430,044	849,004	241,746,365
National Park Service	473,032	2,292	110,288	31,183	76,520,318
USFWS	328,530	0	0	0	84,456,688
Military	2,580,713	12,776	0	0	20,174,195
Other Federal	205,124	0	0	690	7,137,418
State Lands	9,131,766	187,540	187,271	131,387	181,586,342
State Trust Lands*	8,874,346	175,058	183,712	121,407	47,981,215
Other State	257,420	12,482	3,559	9,980	133,605,127
Tribal Lands	7,689,595	1,814,367	924,522	2,214,192	101,033,432
City, County, Other	68,184	132	48	574	11,823,511
Percent of Total					
Private Lands	44.4%	29.6%	32.7%	8.7%	59.4%
Conservation Easement	1.2%	0.1%	0.2%	0.0%	1.4%
Federal Lands	33.8%	13.1%	29.1%	24.9%	27.6%
Forest Service	11.9%	5.6%	10.5%	0.0%	8.5%
BLM	17.4%	7.1%	14.8%	24.0%	10.7%
National Park Service	0.6%	0.1%	3.8%	0.9%	3.4%
USFWS	0.4%	0.0%	0.0%	0.0%	3.7%
Military	3.3%	0.4%	0.0%	0.0%	0.9%
Other Federal	0.3%	0.0%	0.0%	0.0%	0.3%
State Lands	11.7%	5.4%	6.4%	3.7%	8.0%
State Trust Lands**	11.4%	5.0%	6.3%	3.4%	2.1%
Other State	0.3%	0.4%	0.1%	0.3%	5.9%
Tribal Lands	9.9%	52.0%	31.8%	62.7%	4.5%
City, County, Other	0.1%	0.0%	0.0%	0.0%	0.5%

* Does not include most water.

** Most state trust lands are held in trust for designated beneficiaries, principally public schools. Managers may lease and sell these lands for a diverse range of uses to generate revenues for the beneficiaries.

- New Mexico has the largest share of federal public lands (33.8%), and McKinley County, NM has the smallest (13.1%).
- New Mexico has the largest share of state public lands (11.7%), and San Juan County, NM has the smallest (3.7%).
- United States has the largest share of private lands (59.4%), and San Juan County, NM has the smallest (8.7%).



Data Sources: U.S. Geological Survey, Gap Analysis Program. 2022. Protected Areas Database of the United States (PADUS) version 3.0

Land Use

Selected Geographies

Land Ownership

What do we measure on this page?

This page describes the share of the selected location that is private and the share that is managed by various public agencies.

The data presented in this report were calculated using Geographic Information System (GIS) tools. Two primary GIS datasets were used: U.S. Census Bureau's TIGER/Line County Boundaries[1] and U.S. Geological Survey's Protected Areas Database (PADUS).[2, 3]

Although every attempt was made to use the best available GIS land ownership dataset, the data sometimes have errors or become outdated. Please report any inaccuracies to eps@headwaterseconomics.org.

Why is it important?

Decisions made by public land managers may influence the local economy, particularly if public lands represent a large portion of the land base. Agency management actions that affect water quality, access to recreation, scenery (as well as other quality-of-life amenities), and the extent and type of resource extraction are particularly important in areas where much of the land is managed by public agencies.

Federal and state land managers, private land owners, and others are constrained in different ways by laws and regulations that dictate how different lands can be managed. Adjacency can offer challenges and opportunities.

In addition, where a large portion of land is owned and managed by federal agencies, local governments may rely heavily on federal PILT ("Payments in Lieu of Taxes") and revenue-sharing payments such as those from the Secure Rural Schools and Community Self-Determination Act or BLM Taylor Grazing Act.

The EPS Federal Land Payments report provides additional information about payments made to counties with federal public lands: https://headwaterseconomics.org/eps.

Land Use

Selected Geographies

Types of U.S. Forest Service Lands

	New Mexico	McKinley County, NM	Cibola County, NM	San Juan County, NM	United States
Total Acres (2009)	77,726,645	3,490,137	2,906,398	3,533,626	2,255,912,699
Forest Service Lands	9,416,229	202,025	317,019	0	192,750,310
Unspecified Designated Area Type	7,967,406	202,025	317,019	0	146,630,207
National Wilderness	1,387,498	0	0	0	36,155,579
National Monument	0	0	0	0	3,661,327
National Recreation Area	44,670	0	0	0	2,950,660
National Game Refuge	0	0	0	0	1,198,099
National Wild River	9,777	0	0	0	568,059
National Recreation River	3,329	0	0	0	398,207
National Scenic River	3,027	0	0	0	289,617
National Scenic Area	0	0	0	0	230,459
Primitive Area	0	0	0	0	173,762
National Volcanic Monument	0	0	0	0	167,427
Special Management Area	522	0	0	0	164,707
Protection Area	0	0	0	0	45,051
Recreation Management Area	0	0	0	0	43,900
National Scenic and Wildlife Area	0	0	0	0	39,171
Scenic Recreation Area	0	0	0	0	12,645
National Botanical Area	0	0	0	0	8,256
National Scenic and Research Area	0	0	0	0	6,637
National Historic Area	0	0	0	0	6,540
Percent of Total					
Forest Service Lands	12.1%	5.8%	10.9%	0.0%	8.5%
Unspecified Designated Area Type	10.3%	5.8%	10.9%	0.0%	6.5%
National Wilderness	1.8%	0.0%	0.0%	0.0%	1.6%
National Monument	0.0%	0.0%	0.0%	0.0%	0.2%
National Recreation Area	0.1%	0.0%	0.0%	0.0%	0.1%
National Game Refuge	0.0%	0.0%	0.0%	0.0%	0.1%
National Wild River	0.0%	0.0%	0.0%	0.0%	0.0%
National Recreation River	0.0%	0.0%	0.0%	0.0%	0.0%
National Scenic River	0.0%	0.0%	0.0%	0.0%	0.0%
National Scenic Area	0.0%	0.0%	0.0%	0.0%	0.0%
Primitive Area	0.0%	0.0%	0.0%	0.0%	0.0%
National Volcanic Monument	0.0%	0.0%	0.0%	0.0%	0.0%
Special Management Area	0.0%	0.0%	0.0%	0.0%	0.0%
Protection Area	0.0%	0.0%	0.0%	0.0%	0.0%
Recreation Management Area	0.0%	0.0%	0.0%	0.0%	0.0%
National Scenic and Wildlife Area	0.0%	0.0%	0.0%	0.0%	0.0%
Scenic Recreation Area	0.0%	0.0%	0.0%	0.0%	0.0%
National Botanical Area	0.0%	0.0%	0.0%	0.0%	0.0%
National Scenic and Research Area	0.0%	0.0%	0.0%	0.0%	0.0%
National Historic Area	0.0%	0.0%	0.0%	0.0%	0.0%

County specific acreages for Forest Service National Game Refuges are not available for the following states: Arkansas, Florida, Georgia, Louisiana, North Carolina, South Carolina, and Tennessee.

Data Sources: USDA, FS - Land Areas Report 2009, Oracle LAR Database

Types of U.S. Forest Service Lands

What do we measure on this page?

This page describes the acreage and share of different U.S. Forest Service land designations.

All acreages on this page were reported by the U.S. Forest Service's Land Areas Report.[4, 5] The total acreage of Forest Service land on this page may differ from that reported on previous pages because of differences in data sources.

Why is it important?

These data allow the user to see the range and scale of U.S. Forest Service land designations that may impact the economic value and uses of associated lands.

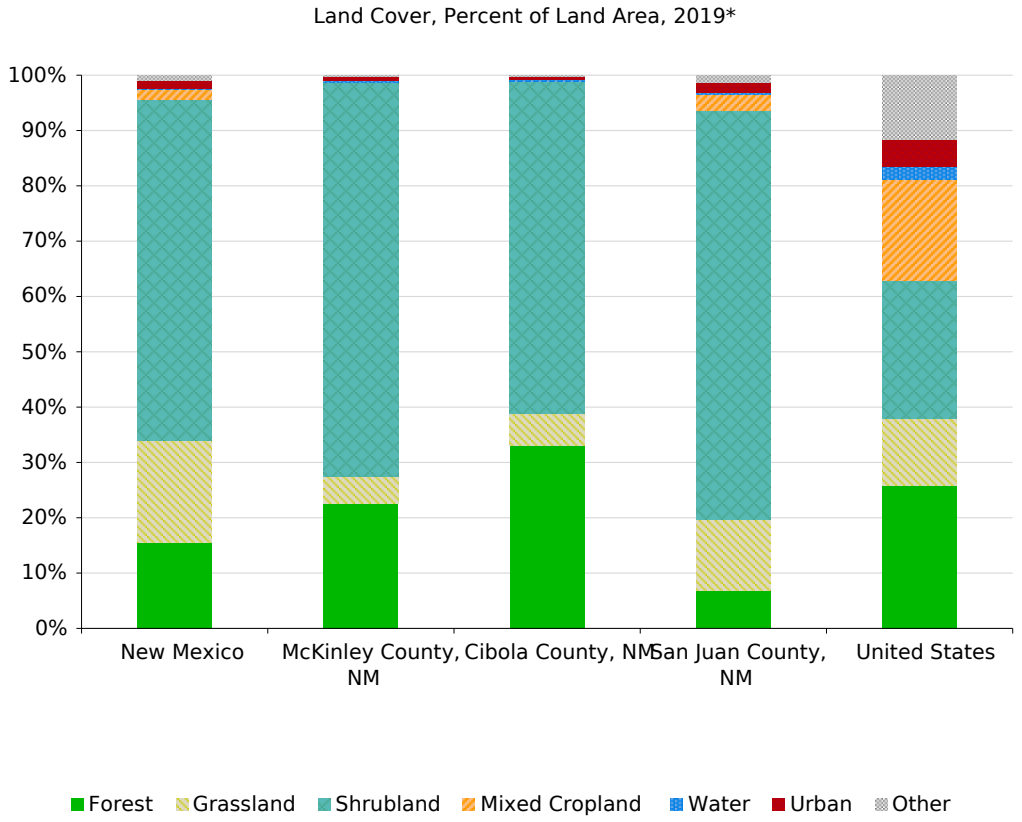
Land Use

Selected Geographies

Forest, Grassland, and Other Land Cover

	New Mexico	McKinley County, NM	Cibola County, NM	San Juan County, NM	United States
Total Acres (2019*)	77,726,645	3,490,137	2,906,398	3,533,626	2,255,912,699
Forest	12,108,904	787,145	962,920	242,721	583,728,643
Grassland	14,255,741	169,893	168,110	452,781	272,352,312
Shrubland	47,886,674	2,495,186	1,751,008	2,612,218	563,498,355
Mixed Cropland	1,550,336	7	265	102,688	411,773,680
Water	112,605	1,734	1,321	11,887	51,726,969
Urban	1,106,328	30,520	19,415	64,162	110,583,282
Other	705,594	5,652	3,358	47,170	261,985,056
Percent of Total					
Forest	15.6%	22.6%	33.1%	6.9%	25.9%
Grassland	18.3%	4.9%	5.8%	12.8%	12.1%
Shrubland	61.6%	71.5%	60.2%	73.9%	25.0%
Mixed Cropland	2.0%	0.0%	0.0%	2.9%	18.3%
Water	0.1%	0.0%	0.0%	0.3%	2.3%
Urban	1.4%	0.9%	0.7%	1.8%	4.9%
Other	0.9%	0.2%	0.1%	1.3%	11.6%

- Cibola County, NM has the largest share of forest cover (33.1%), and San Juan County, NM has the smallest (6.9%).
- New Mexico has the largest share of grassland cover (18.3%), and McKinley County, NM has the smallest (4.9%).
- San Juan County, NM has the largest share of shrubland cover (73.9%), and United States has the smallest (25%).



Data Sources: Dewitz, J., and U.S. Geological Survey, 2021, National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release, https://doi.org/10.5066/P9KZCM54.*

Forest, Grassland, and Other Land Cover

What do we measure on this page?

This page describes the acreage and share of various land cover types.

The National Land Cover Database (NLCD) was selected to describe cover types because it is publicly available and has a relatively small number of general classes that are easily summarized.[6]

NLCD is based primarily on a decision-tree classification of Landsat satellite data, and uses a 16-class land cover classification scheme that has been applied consistently across the United States.[7] These classes were summarized into seven classes as follows:

Forest: An aggregate of the following NLCD classes: Evergreen Forest, Deciduous Forest, and Mixed Forest.

Grassland: An aggregate of the following NLCD classes: Grasslands, Sedge, Lichens, and Moss.

Shrubland: An aggregate of the following NLCD classes: Dwarf Scrub and Shrub/Scrub.

Mixed Cropland: An aggregate of the following NLCD classes: Pasture/Hay and Cultivated Crops.

Water: The same in the original NLCD Open Water classification.

Urban: An aggregate of the four Developed classes within NLCD.

Other: An aggregate of the following NLCD classes: Barren Land, Perennial Ice/Snow, and the two Wetlands classifications.

*Land cover data for the lower 48 states are from 2019. Alaska land cover data are from 2016. Hawaii land cover data ranges from 2005-2011.[11]

Why is it important?

The mix of land cover influences a range of socioeconomic and natural factors, including potential and suitable economic activities, the availability of recreation opportunities, water storage, the potential for wildfire, and other cultural and economic factors.

For data on development in wildfire-prone areas, create an EPS Wildland-Urban Interface report at https://headwaterseconomics.org/eps.

Land Use

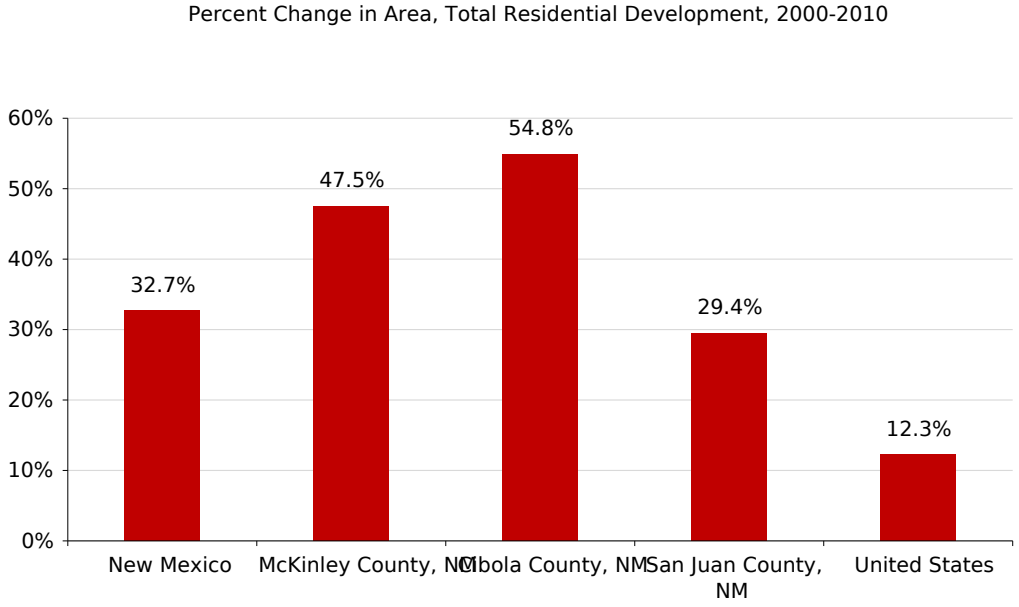
Selected Geographies

Residential Development (Acres)

	New Mexico	McKinley County, NM	Cibola County, NM	San Juan County, NM	United States
Total Private Land, Acres (2000-2010)	34,538,278	1,032,215	949,415	306,596	1,339,427,106
Total Residential, 2000	1,137,333	70,570	28,645	95,756	190,918,648
Urban/Suburban, 2000	251,935	6,429	3,312	13,866	31,001,465
Exurban, 2000	885,396	64,141	25,333	81,890	159,917,167
Total Residential, 2010	1,508,682	104,108	44,351	123,942	214,475,717
Urban/Suburban, 2010	310,323	7,771	3,470	18,161	37,816,640
Exurban, 2010	1,198,357	96,337	40,880	105,781	176,659,056
Percent Change in Total Residential	32.7%	47.5%	54.8%	29.4%	12.3%
Percent of Total*					
Total Residential, 2000	3.3%	6.8%	3.0%	31.2%	14.3%
Urban/Suburban, 2000	0.7%	0.6%	0.3%	4.5%	2.3%
Exurban, 2000	2.6%	6.2%	2.7%	26.7%	11.9%
Total Residential, 2010	4.4%	10.1%	4.7%	40.4%	16.0%
Urban/Suburban, 2010	0.9%	0.8%	0.4%	5.9%	2.8%
Exurban, 2010	3.5%	9.3%	4.3%	34.5%	13.2%

* The percentages in this table represent the percent of private land developed at various housing densities, and should not sum to 100%.

- From 2000 to 2010, Cibola County, NM had the largest percent change in residential development (54.8%), and United States had the smallest (12.3%).



Data Sources: Theobald, DM. 2013. Land use classes for ICLUS/SERGoM v2013. Unpublished report, Colorado State University.

Residential Development (Acres)

What do we measure on this page?

This page describes the area (in acres) used for housing and the rate at which this area is growing.

Comparisons in development patterns are made between 2000 and 2010. The data can also be used to draw comparisons between locations. These are the latest published data available from the Decennial Census.

Statistics are provided for residential areas developed at relatively high densities (urban/suburban areas where the average residential lot sizes are less than 1.7 acres) and those developed at relatively low densities (exurban areas where the average lot sizes are between 1.7 and 40 acres). Urban/suburban areas, as shown here, combine “urban” housing densities (less than 0.25 acres per unit) and “suburban” housing densities (0.25–1.7 acres per unit). Urban and suburban are represented in one class because they often represent a small proportion of the land area within counties. Lot sizes greater than 40 acres are more typical of working agricultural landscapes and are not considered residential, and therefore are not discussed here.

Locations with a large percent change in the area of residential development often have experienced significant in-migration from more urbanized areas. Counties with a small percent change either experienced little growth or were already highly urbanized in 2000.[8]

Why is it important?

In the past decade, the conversion of open space and agricultural land to residential development has continued at a rapid pace in many parts of the U.S. The popularity of exurban lot sizes in much of the country has exacerbated this trend. Low-density development results in a larger area of land converted to residential development.[9]

This pattern of development reflects several factors, including demographic trends, the increasingly "footloose" nature of economic activity, the availability and price of land, and preferences for homes on larger lots. Development patterns can affect resident’s quality of life and safety, and impact protected areas as development increasingly pushes up against public land boundaries.[10] Human-wildlife conflicts and wildfire threats may become more serious issues as development continues. In addition, there may be new demands for recreation opportunities and concern about commodity uses of the landscape.

For data on development in wildfire-prone areas, create an EPS Wildland-Urban Interface report at https://headwaterseconomics.org/eps.

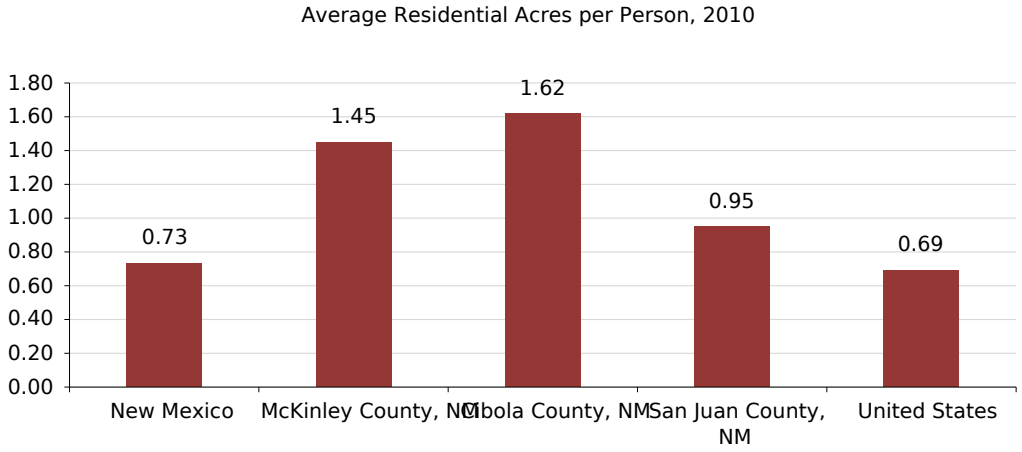
Land Use

Selected Geographies

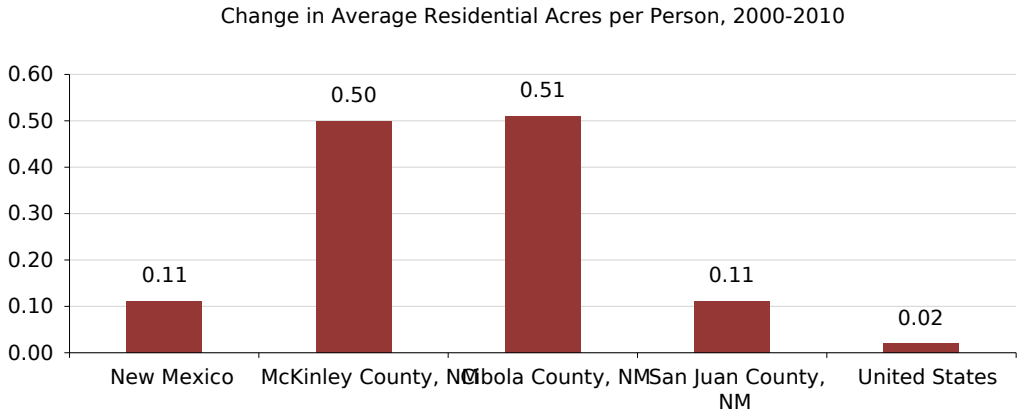
Residential Development (Population Density)

	New Mexico	McKinley County, NM	Cibola County, NM	San Juan County, NM	United States
Residential Acres/Person, 2000	0.62	0.95	1.12	0.84	0.67
Residential Acres/Person, 2010	0.73	1.45	1.62	0.95	0.69
Change in Residential Acres/Person, 2000-2010*	0.11	0.50	0.51	0.11	0.02
Private Acres/Person, 2010	16.72	14.37	34.77	2.36	4.29

- In 2010, Cibola County, NM had the largest average acreage in residential development per person (34.77 acres), and San Juan County, NM had the smallest (2.36 acres).



- From 2000 to 2010, Cibola County, NM had the largest change in average acreage in residential development per person (0.51 acres), and United States had the smallest (0.02 acres).



Data Sources: Theobald, DM. 2013. Land use classes for ICLUS/SERGoM v2013. Unpublished report, Colorado State University.

Residential Development (Population Density)

What do we measure on this page?

This page describes the degree to which development patterns have changed (becoming more or less dense) between 2000 and 2010.

Per capita consumption of land used for housing is a measure of the pattern of development (i.e., denser or more sprawling). Comparisons in development patterns are made between 2000 and 2010. The data can also be used to draw comparisons between locations. These are the latest published data available from the Decennial Census.

Land consumption is expressed as the average number of acres that each person uses for housing (the average lot size) within a selected location. Importantly, these figures refer only to residential development and do not include farms or ranches greater than 40 acres. Population density is also displayed as the acres of private land per person.

Areas with negative values of change in residential acres/person were more densely developed in 2010 than in 2000. Large positive values of change indicate that an area was substantially more sprawling in 2010 than it was in 2000. It is important to note that a small change does not indicate that the selected location is not sprawling, but rather that the pattern of development has not changed substantially over the time period.

Why is it important?

Outside of urban areas, large lot development has increased since the 1970s in many parts of the country.

Population growth is a metric often used to describe human impacts. However, in most locations land consumption is outpacing population growth. In these areas, land consumption (the area of land used for residential development) is strongly related to the loss of natural areas and impacts on ecological processes. Impacts include changes in ecosystem structure; effects on crucial wildlife habitat; and exposure to humans through hunting, exotic species, and disease.[9]

The pattern of land consumption in 2010 shown in the top graph (*Average Residential Acres per Person*) is equally important as the change in land consumption shown in the bottom graph (*Change in Average Residential Acres per Person*). Locations where the average number of residential acres per person is greater than one acre have considerable sprawling development.

Data Sources & Methods

The EPS Land Use report uses national data sources to represent land cover and residential development. In an effort to report more accurate statistics for land ownership, a compilation of state-level data was used. All the data in this report were the result of calculations made in Geographic Information Systems (GIS). The contact information for databases used in this profile is:

- **TIGER/Line County Boundaries**
  Bureau of the Census, U.S. Department of Commerce
  https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html
- **Protected Areas Database**
  U.S. Geological Survey, Gap Analysis Program
  https://gapanalysis.usgs.gov/padus/
- **Developed Areas**
  Theobald, DM. 2013. Land use classes for ICLUS/SERGoM v2013.
  Unpublished report, Colorado State University.
- **National Land Cover Database**
  Multi-Resolution Land Characteristics Consortium
  https://www.mrlc.gov/
- **USDA Forest Service**
  Land Areas Report, Oracle LAR Database
  https://www.fs.fed.us/land/staff/lar-index.shtml

EPS core approaches
EPS is designed to focus on long-term trends across a range of important measures. Trend analysis provides a more comprehensive view of changes than spot data for select years. We encourage users to focus on major trends rather than absolute numbers. EPS displays detailed industry-level data to show changes in the composition of the economy over time and the mix of industries at points in time. EPS employs cross-sectional benchmarking—comparing smaller areas such as counties to larger regions, states, and the nation—to give a sense of relative performance. EPS allows users to aggregate data for multiple locations to allow for more sophisticated cross-sectional comparisons.

Endnotes

1 - U.S. Census Bureau TIGER/Line Boundaries are available at https://census.gov/geo/maps-data/data/tiger-line.html.

2 - The U.S. Geological Survey Protected Aeas Database (PADUS) is available at https://gapanalysis.usgs.gov/padus/.

3 - If accurate measurements of water surface area are needed, the U.S. Geological Survey's national hydrography dataset can be used: https://nhd.usgs.gov/.

4 - A copy of the most recent Forest Service Land Areas Report, including detailed tables, is available at https://www.fs.fed.us/land/staff/lar-index.shtml.

5 - U.S. Forest Service Land Areas Report definitions of terms are available at https://www.fs.fed.us/land/staff/lar/definitions_of_terms.htm.

6 - Land cover data is available from many sources. Other commonly used datasets in the United States are the U.S. Geological Survey's National Land Cover Dataset and state and regional GAP datasets available from the U.S. Geological Survey's National Biological Information Infrastructure. Information about these and many other land cover datasets can be viewed at https://www.usgs.gov/centers/eros/science/national-land-cover-database.

7 - For more information about the National Land Cover Database, see https://www.mrlc.gov/.

8 - For an overview of past national land-use trends, see Brown DG, Johnson KM, Loveland TR, and Theobald DM. 2005. Rural land-use trends in the conterminous United States, 1950–2000. Ecological Applications 15(6):1851–1863; Theobald DM. 2005. Landscape Patterns of Exurban Growth in the USA from 1980 to 2020. Ecology and Society 10(1):32.

9 - The following paper provides an overview of the ecological effects of residential development: Hansen AJ, Knight R, Marzluff J, Powell S, Brown K, Hernandez P, and Jones K. 2005. Effects of exurban development on biodiversity: patterns, mechanisms, research needs. Ecological Applications 15(6):1893-1905.

10 - The following papers focus on the effects of land-use change on nearby protected landscapes: Hansen AJ and DeFries R. 2007. Ecological mechanisms linking protected areas to surrounding lands. Ecological Applications 17(4):974-988; and Gude PH, Hansen AJ, Rasker R, Maxwell B. 2006. Rates and Drivers of Rural Residential Development in the Greater Yellowstone. Landscape and Urban Planning 77:131-151.

11 - Land cover data for the lower 48 states are from 2019. https://www.mrlc.gov/data/nlcd-2019-land-cover-conus
Land cover data for Alaska are from 2016. https://www.mrlc.gov/data/nlcd-2016-land-cover-alaska
Hawaii landcover data ranges from 2005-2011 (Hawaii, 2010; Kahoolawe, 2005; Kauai, 2010; Lanai, 2011; Maui, 2010; Molokai, 2010; Niihau, 2010; Oahu, 2011). https://coast.noaa.gov/digitalcoast/data/ccaphighres.html

Land Use

Selected Geographies

Data Alerts

Geography-Related Messages

Cibola County, NM: Data for Cibola County, NM, begins in 1982. Prior to that, Cibola was part of Valencia County.

Report-Related Messages

(no messages)