Coastline Population Trends in the United States: 1960 to 2008

Population Estimates and Projections

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Coastline counties of the United States, located along the country's saltwater edges, account for just 254 of the nation's 3,142 counties yet contain 29 percent of its population, 5 of its 10 most populous cities, and 7 of its 10 most populous counties. Bordering the Atlantic and Pacific Oceans and the Gulf of Mexico, these bands of counties provide the setting for an intense concentration of economic and social activity. Shaped by migration, trade, and environmental factors, population trends in coastline counties are distinct from those for the nation as a whole or its noncoastline counties.

This report examines population trends in coastline counties and those counties' shares of coastline states for the period 1960 to 2008. With counties as a geographic base, the report uses decennial census data from 1960 to 2000 and population estimates for 2000 through 2008 to examine trends in population growth and decline, geographic distribution, and density of the coastline population. One area of interest in recent decades has been the growth of the coastline population in hurricane-prone areas. The last section of the report incorporates historical data on the trajectories of hurricanes striking the U.S. coastlines to broadly gauge the coastline population's recent experiences with hurricanes.

Since 1991, the U.S. Census Bureau has been publishing population statistics on *coastal* counties classified as such by the National Oceanic and Atmospheric Administration (NOAA). The NOAA definition provides an environmentally based statistical reporting unit. The *coastline* county definition applied in this report is based on location, including only those counties that border coastal water or territorial sea.

POPULATION TRENDS

The population in coastline counties has grown steadily in recent decades, increasing from 47 million people in 1960 to 87 million people in 2008 (Appendix Table A). During this period, the Pacific coastline region gained the largest number of people (17 million), followed by the Atlantic (15 million) and the Gulf of Mexico (8 million) (Table 1). During the 1960s, 1970s, and 1980s, the Pacific was the largest-gaining coastline region, but, since 1990, the Atlantic region has been the largest numeric gainer. Since 1960, the coastline population has consistently added between 5 million and 10 million people each decade, and its gain has always been smaller than that for noncoastline counties. In the 1980s, the coastline increase of 9.5 million accounted for 43 percent of the country's total population increase. In the 1990s, however, population growth in coastline counties dropped slightly, to 9.1 million, while growth in

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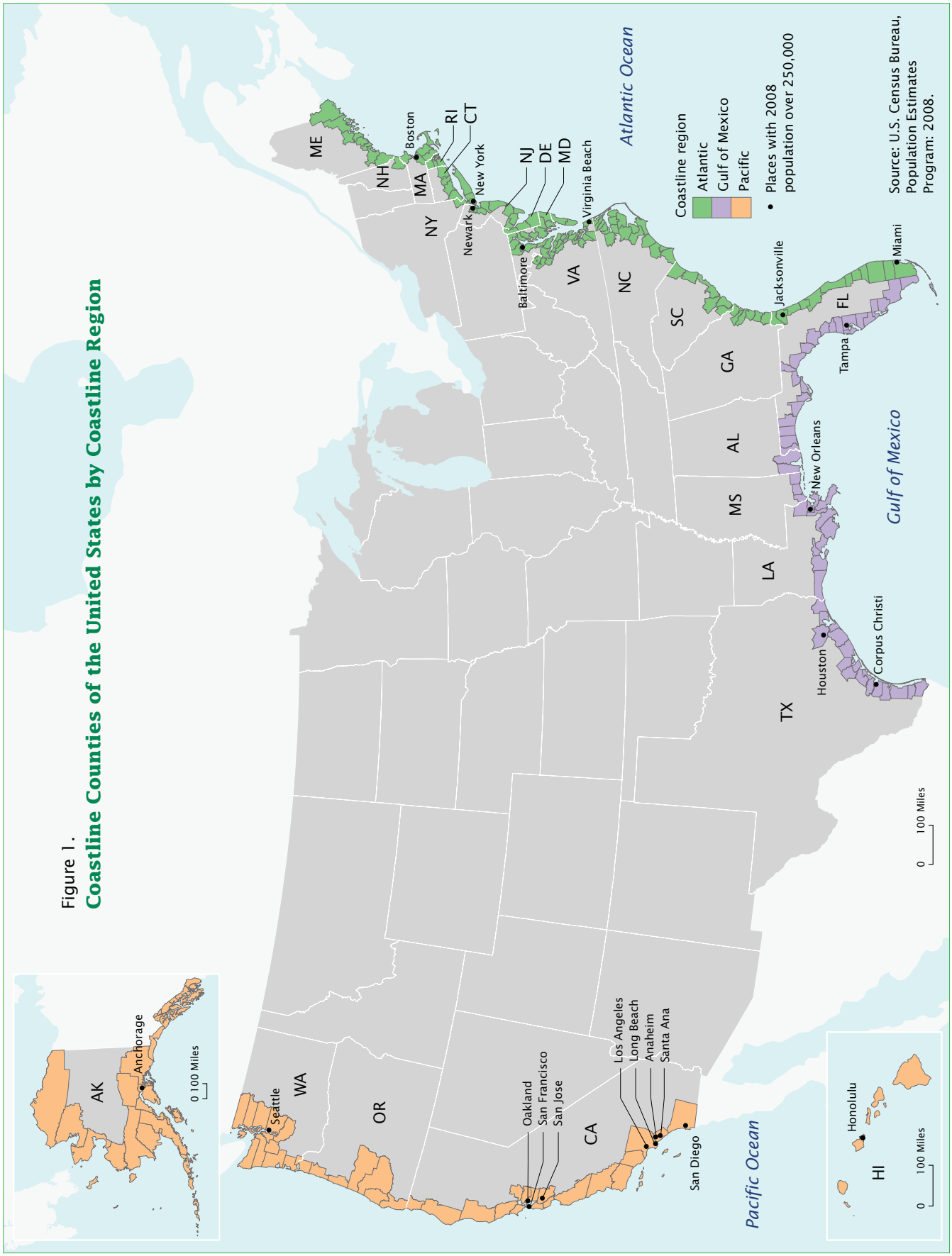


Figure 1.
Coastline Counties of the United States by Coastline Region
Atlantic Ocean
Gulf of Mexico
Pacific Ocean
Coastline region
Atlantic
Gulf of Mexico
Pacific
Places with 2008 population over 250,000
Source: U.S. Census Bureau, Population Estimates Program: 2008.
0 100 Miles
ME
NH
MA
RI
CT
NY
NJ
DE
MD
VA
NC
SC
GA
FL
AL
MS
LA
TX
CA
OR
WA
AK
HI
Boston
New York
Newark
Baltimore
Virginia Beach
Jacksonville
Miami
Tampa
New Orleans
Houston
Corpus Christi
Los Angeles
Long Beach
Anaheim
Santa Ana
Oakland
San Francisco
San Jose
San Diego
Seattle
Anchorage
Honolulu

COASTLINE COUNTIES DEFINED

To qualify as coastline, a county has to be adjacent to water classified as either coastal water or territorial sea. The Census Bureau's Topologically Integrated Geographic Encoding and Referencing (TIGER®) system lists four types of water: inland water, coastal water, territorial sea, and Great Lakes (U.S. Census Bureau, 1994). Coastal water and territorial sea include portions of the oceans, the Gulf of Mexico, the Caribbean Sea, and the Bering Sea, but do not include the Great Lakes. Therefore, for the purposes of this report, counties along the Great Lakes are not classified as coastline counties. If a county's inclusion was in question, the 2009 Area Hydrography TIGER® file was referenced. If the county in question is adjacent to water classified as bay, estuary, gulf, sound, ocean, or sea, the county is considered coastline.

There are 254 coastline counties, stretching across parts of 23 states and covering 561,435 square miles. Coastline counties are located in three coastline regions: the Atlantic (129 counties), Gulf of Mexico (56 counties), and Pacific (69 counties) (Figure 1). These regions differ from the four standard census regions (Northeast, Midwest, South, and West).

NOAA COASTAL COUNTIES

NOAA defines a county as coastal if "1) at least 15 percent of [the] county's total land area is located within the Nation's coastal watershed; or 2) a portion of or [the] entire county accounts for at least 15 percent of a coastal cataloging unit" (for example, an individual drainage basin) (Wiley, 2003). This definition is well suited for evaluating how human activities occurring inland can affect water- and habitat-quality along the coast. However, most of the counties are not adjacent to a body of saltwater, and these nonadjacent counties are sometimes not perceived as coastal.

NOAA classifies 674 coastal counties among four regions: the Atlantic (283 counties), Gulf of Mexico (144 counties), Pacific (89 counties), and Great Lakes (158 counties). The total population of these counties has grown from 95 million in 1960 to 157 million in 2008, an increase of 67 percent.

noncoastline counties soared to 23.6 million from 12.7 million in the 1980s. In the 2000 to 2008 period, the coastline gain of 5.3 million people represented just 23 percent of the country's total population increase of 22.6 million people.

Between 1960 and 2008, the percentage increase in population along the coastline (84 percent) was greater than that of the United States (70 percent) or for noncoastline counties (64 percent). Among the coastline regions, the percentage increase in population in the Gulf of Mexico (150 percent) and the Pacific (110 percent) far outpaced the gains for the Atlantic region (56 percent), although the Atlantic region added the most new coastline residents in both the 1990s and post-2000 periods. The Gulf of Mexico, starting from a small population base (5.6 million people in 1960), has maintained consistently higher percentage increases in population than the nation, the overall coastline, and noncoastline counties, with double-digit percentage increases in all periods.

In the decades from 1960 through 1990, the coastline population's percent increase was higher than those of both the nation and its noncoastline counties. The situation has changed, however, for the post-1990 period, as the growth in coastline counties fell below the growth for the nation and its noncoastline counties. Between 2000 and 2008, noncoastline counties grew by 9 percent, compared to a 7 percent gain for coastline counties.

Table 1.
Population Change in Coastline and Noncoastline Counties: 1960 to 2008

Area	Period					Change, 1960 to 2008
	1960–1970	1970–1980	1980–1990	1990–2000	2000–2008	
NUMBER (in milions)						
United States	**23.9**	**23.3**	**22.2**	**32.7**	**22.6**	**124.7**
Coastline counties	**9.3**	**6.9**	**9.5**	**9.1**	**5.3**	**40.0**
Atlantic	3.8	1.5	3.3	4.0	2.4	14.9
Gulf of Mexico	1.4	2.2	1.6	1.8	1.4	8.4
Pacific	4.1	3.2	4.6	3.3	1.6	16.7
Noncoastline counties	**14.6**	**16.5**	**12.7**	**23.6**	**17.3**	**84.8**
PERCENT						
United States	**13.3**	**11.5**	**9.8**	**13.2**	**8.0**	**69.6**
Coastline counties	**19.5**	**12.1**	**14.9**	**12.4**	**6.5**	**84.3**
Atlantic	14.2	4.9	10.3	11.3	6.0	56.0
Gulf of Mexico	24.7	31.9	17.2	17.1	10.9	150.2
Pacific	27.0	16.4	20.4	12.0	5.2	109.7
Noncoastline counties	**11.1**	**11.2**	**7.8**	**13.5**	**8.7**	**64.3**

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

Table 2.
Share of State Population in Coastline Counties: 1960 to 2008

Area	Percentage of state population inside coastline counties						Percentage-point change, 1960 to 2008
	1960	1970	1980	1990	2000	2008	
Total for coastline counties	**49.5**	**50.6**	**49.8**	**49.9**	**49.0**	**47.7**	**–1.8**
Maine	45.4	46.9	48.7	50.8	53.6	54.2	8.8
New Hampshire	16.3	18.8	20.7	22.2	22.4	22.6	6.3
Massachusetts	50.4	50.3	51.1	51.5	52.3	52.6	2.1
Rhode Island	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Connecticut	62.7	62.1	62.3	61.8	62.3	62.0	–0.7
New York	62.9	62.2	60.1	60.1	61.6	62.5	–0.4
New Jersey	54.2	52.3	52.0	51.8	51.9	51.6	–2.6
Delaware	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Maryland	65.3	58.5	56.9	54.0	52.1	51.7	–13.7
Virginia	33.4	36.2	36.8	40.2	39.9	39.3	5.9
North Carolina	9.7	9.4	9.6	10.2	9.9	9.9	0.2
South Carolina	16.9	17.1	17.1	17.8	18.5	19.6	2.7
Georgia	6.8	6.1	6.0	6.0	5.4	4.9	–1.9
Florida	77.5	79.4	78.6	77.8	76.9	75.7	–1.8
Alabama	11.1	10.9	11.4	11.8	12.1	12.5	1.3
Mississippi	8.7	10.8	11.9	12.1	12.8	11.9	3.2
Louisiana	36.6	38.0	37.5	36.7	36.0	32.3	–4.3
Texas	24.1	25.7	26.7	25.4	24.6	24.1	0.1
California	78.0	78.4	76.1	73.1	71.3	68.5	–9.5
Oregon	21.0	20.4	20.5	19.4	17.9	17.0	–4.0
Washington	62.6	65.9	64.1	66.3	65.5	64.9	2.3
Alaska	78.0	81.0	83.2	83.3	84.5	83.6	5.7
Hawaii	100.0	100.0	100.0	100.0	100.0	100.0	0.0

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

INFORMATION TO ASSIST IN INTERPRETING THE MAPS AND TABLES

The maps and tables in this report were designed to facilitate an understanding of the patterns of change in population and housing along the U.S. coastline. Figure 1 provides an overview of the coastline states and coastline counties classified by region. Places with 2008 populations of 250,000 or more that are largely within coastline counties are also shown. The remaining maps present a closer look at coastline counties by removing most of the country's interior section and enlarging the coastline regions. Tables with data for coastline regions and portions of coastline states are arranged geographically, starting with states in the Northeast, following the Atlantic coastline southward around the Florida peninsula, westward along the Gulf of Mexico to the tip of Texas, then along the Pacific in California and heading north to Washington. Alaska and Hawaii are included in the Pacific coastline region.

Twenty-three states contain coastline counties. The coastline counties' shares of state population have fluctuated in recent decades (Table 2). Between 1960 and 2008, the coastline share of the population increased in 11 states and declined in 9. (Three states—Rhode Island, Delaware, and Hawaii—have their entire population in coastline counties.) During this period, consistent increases or decreases of the coastline share of population in each state were rare. Some of the largest percentage-point increases were in New England,[1] where Maine's coastline share of its total population increased by 9 percentage points and New Hampshire's by 6 percentage points. Virginia and Alaska also had increases of more than 5 percentage points. In all 4 of these states, counties adding the most new residents were along the coastline.

[1]New England consists of the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.

In contrast, the population has become less coastline-oriented for other states. For example, the share of Maryland's population in its coastline counties dropped from 65 percent in 1960 to 52 percent in 2008. Similarly, California's coastline population-share dropped from 78 percent in 1960 and 1970 to 69 percent in 2008.

With the exception of New Hampshire—whose coastline is relatively short (about 14 miles)—in all states from Maine through Maryland, the 2008 coastline populations exceeded 50 percent. Other states with majority coastline populations were Florida, California, Washington, Alaska, and Hawaii. Nine states had less than 25 percent of their populations in coastline counties, including New Hampshire, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Texas, and Oregon.

Because of regional variation in coastline population growth, the share of the total U.S. coastline population in some states has changed considerably since 1960. Florida, for instance, contained 8 percent of the nation's coastline population in 1960 and doubled its share to 16 percent by 2008 (Table 3). Virginia, Texas, California, and Washington each gained between 1 and 3 percentage points during the same period. The only state in the Northeast with an increasing share of the total coastline population was New Hampshire, although its gain was less than 1 percentage point. New York had both the largest overall decrease in share, declining 8 percentage points, and the largest decrease in share between each decade. Along the Atlantic region,

MEASURING CHANGE IN THE COASTLINE'S RESIDENT POPULATION

The coastline population trends examined in this report refer to changes in an area's resident population, which consists of those people usually residing in that particular area (where they live and sleep most of the time). This measure of change in the population does not capture the temporal variations in population that occur in some coastline counties. For example, some areas contain seasonal housing units that are occupied only parts of the year. In addition, some northern coastline areas may swell substantially during the summer months and southern areas during the winter months as thousands of people arrive to vacation there.

Table 3.
Share of U.S. Coastline Population by State: 1960 to 2008

Area	Percentage of U.S. coastline population inside state						Percentage-point change, 1960 to 2008
	1960	1970	1980	1990	2000	2008	
Total for coastline counties	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**(X)**
Maine	0.9	0.8	0.9	0.9	0.8	0.8	–0.1
New Hampshire	0.2	0.2	0.3	0.3	0.3	0.3	0.1
Massachusetts	5.5	5.0	4.6	4.2	4.0	3.9	–1.6
Rhode Island	1.8	1.7	1.5	1.4	1.3	1.2	–0.6
Connecticut	3.3	3.3	3.0	2.8	2.6	2.5	–0.9
New York	22.3	20.0	16.6	14.8	14.2	13.9	–8.3
New Jersey	6.9	6.6	6.0	5.5	5.3	5.1	–1.8
Delaware	0.9	1.0	0.9	0.9	1.0	1.0	0.1
Maryland	4.3	4.0	3.8	3.5	3.4	3.3	–0.9
Virginia	2.8	3.0	3.1	3.4	3.4	3.5	0.7
North Carolina	0.9	0.8	0.9	0.9	1.0	1.0	0.1
South Carolina	0.9	0.8	0.8	0.9	0.9	1.0	0.2
Georgia	0.6	0.5	0.5	0.5	0.5	0.5	–0.0
Florida	8.1	9.5	12.1	13.8	15.0	15.9	7.8
Alabama	0.8	0.7	0.7	0.7	0.7	0.7	–0.1
Mississippi	0.4	0.4	0.5	0.4	0.4	0.4	0.0
Louisiana	2.5	2.4	2.5	2.1	2.0	1.6	–0.9
Texas	4.9	5.1	6.0	5.9	6.2	6.7	1.9
California	25.8	27.6	28.3	29.8	29.4	28.8	3.0
Oregon	0.8	0.8	0.8	0.8	0.7	0.7	–0.0
Washington	3.8	4.0	4.2	4.4	4.7	4.9	1.1
Alaska	0.4	0.4	0.5	0.6	0.6	0.7	0.3
Hawaii	1.3	1.4	1.5	1.5	1.5	1.5	0.1

(X) Not applicable.

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

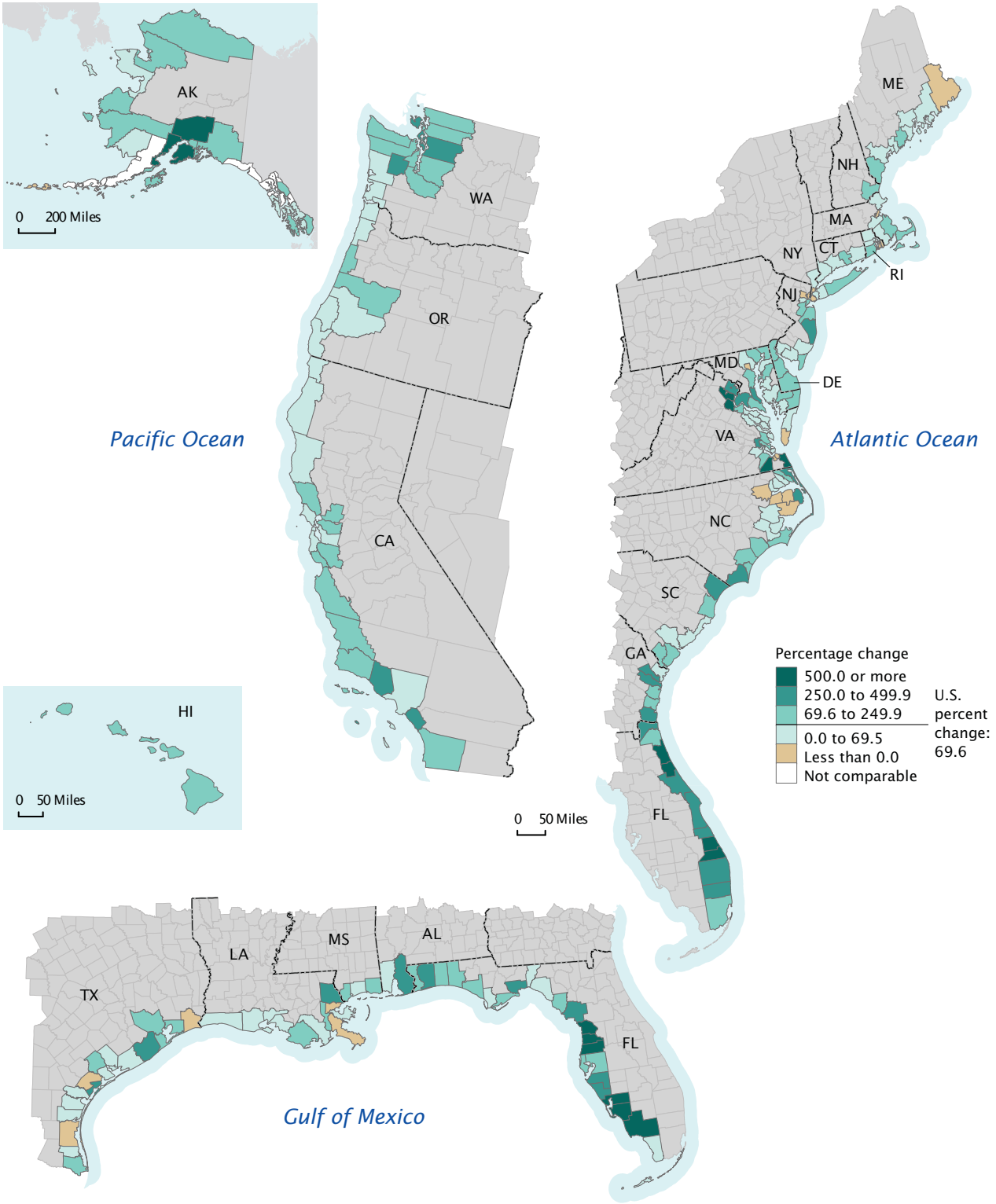
Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

Maryland and Georgia had decreasing shares. The population in those two states grew but not as fast as the overall coastline population during the same period. In 1960, Florida's share of the coastline population was about one-third the size of New York's. By 2008, Florida's 16 percent share of the coastline population exceeded New York's 14 percent share. Other states along the Gulf of Mexico had only small increases in share, with Texas up by 2 percentage points and Mississippi up less than 1 percentage point, or decreases in share (Alabama and Louisiana). While the Pacific's overall share of coastline population increased between 1960 and 2008 (4 percent), California's share peaked in 1990, and both Oregon's and Hawaii's shares have held steady since 2000. Only Washington and Alaska increased their shares between 2000 and 2008.

Most coastline counties (223 of 254) gained population between 1960 and 2008, and their gains were above the average (70 percent) for all U.S. counties (Figure 2). Along the Atlantic and Gulf of Mexico, counties from the southern coast of North Carolina through Mississippi all experienced population increases during the period. All counties bordering the Pacific coastline from California through Washington gained population during this time as well. Coastline counties that declined in population over the 48 years are located primarily in clusters along the Atlantic from Maine through northern North Carolina, and a few are on the Gulf of Mexico dotting the Louisiana and Texas coastlines.

In several instances, a state that had a decrease in coastline population share can attribute that negative change to population decline in a large city, such as Baltimore in Maryland, and New Orleans in Louisiana. Florida's increase in share can be attributed to several counties (four along the Atlantic and six along the Gulf) experiencing greater than 500 percent change in population since 1960. Even though Oregon had a slight decrease in share, as noted earlier, all of its coastline counties posted growth between 1960 and 2008. However, the majority of those counties increased at percentages below the national average.

Figure 2.
Change in Coastline Population by County: 1960 to 2008



Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960; Population Estimates Program: 2008.

Table 4.

Coastline Counties With Largest Numeric and Percentage Population Change: 1960 to 2008

County and state	Coastline region	Population		Change, 1960 to 2008
		1960	2008	
NUMBER				
Los Angeles County, CA	Pacific	6,038,771	9,862,049	3,823,278
Harris County, TX	Gulf of Mexico	1,243,158	3,984,349	2,741,191
Orange County, CA	Pacific	703,925	3,010,759	2,306,834
San Diego County, CA	Pacific	1,033,011	3,001,072	1,968,061
Miami-Dade County, FL	Atlantic	935,047	2,398,245	1,463,198
Broward County, FL	Atlantic	333,946	1,751,234	1,417,288
Santa Clara County, CA	Pacific	642,315	1,764,499	1,122,184
Palm Beach County, FL	Atlantic	228,106	1,265,293	1,037,187
King County, WA	Pacific	935,014	1,875,519	940,505
Suffolk County, NY	Atlantic	666,784	1,512,224	845,440
Hillsborough County, FL	Gulf of Mexico	397,788	1,180,784	782,996
Fairfax County, VA	Atlantic	275,002	1,015,302	740,300
Contra Costa County, CA	Pacific	409,030	1,029,703	620,673
Ventura County, CA	Pacific	199,138	797,740	598,602
Alameda County, CA	Pacific	908,209	1,474,368	566,159
Lee County, FL	Gulf of Mexico	54,539	593,136	538,597
Pinellas County, FL	Gulf of Mexico	374,665	910,260	535,595
Snohomish County, WA	Pacific	172,199	683,655	511,456
Queens County, NY	Atlantic	1,809,578	2,293,007	483,429
Pierce County, WA	Pacific	321,590	785,639	464,049
PERCENT				
Collier County, FL	Gulf of Mexico	15,753	315,258	1,901.3
Flagler County, FL	Atlantic	4,566	91,247	1,898.4
Matanuska-Susitna Borough, AK	Pacific	5,188	85,458	1,547.2
Hernando County, FL	Gulf of Mexico	11,205	171,689	1,432.3
Citrus County, FL	Gulf of Mexico	9,268	141,416	1,425.9
Pasco County, FL	Gulf of Mexico	36,785	471,028	1,180.5
Charlotte County, FL	Gulf of Mexico	12,594	150,060	1,091.5
Lee County, FL	Gulf of Mexico	54,539	593,136	987.5
Kenai Peninsula Borough, AK	Pacific	6,097	53,409	776.0
Martin County, FL	Atlantic	16,932	138,660	718.9
Prince William County, VA	Atlantic	50,164	364,734	627.1
Stafford County, VA	Atlantic	16,876	121,736	621.4
St. Lucie County, FL	Atlantic	39,294	265,108	574.7
St. Johns County, FL	Atlantic	30,034	181,540	504.4
Wakulla County, FL	Gulf of Mexico	5,257	31,089	491.4
St. Tammany Parish, LA	Gulf of Mexico	38,643	228,456	491.2
Dare County, NC	Atlantic	5,935	33,584	465.9
Calvert County, MD	Atlantic	15,826	88,698	460.5
Palm Beach County, FL	Atlantic	228,106	1,265,293	454.7
James City County, VA	Atlantic	11,539	62,414	440.9

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960; Population Estimates Program: 2008.

Los Angeles County, California, had the largest numeric population gain from 1960 to 2008 of any coastline county, growing from 6 million to 9.9 million (Table 4). Seven other coastline counties also gained more than 1 million people over the same 48-year period (Harris County, Texas; Orange County, California; San Diego County, California; Miami-Dade County, Florida; Broward County, Florida; Santa Clara County, California; and Palm Beach County, Florida). Of the 20 largest numeric gainers, 13 were in either California or Florida, 3 were in Washington State, 2 in New York, and 1 each in Texas and Virginia.

The coastline county with the largest percentage increase in population between 1960 and 2008 was Collier County, Florida, at 1,900 percent. Six other coastline counties grew by more than 1,000 percent between 1960 and 2008: Flagler County, Florida; Matanuska-Susitna Borough, Alaska; Hernando County, Florida; Citrus County, Florida; Pasco County, Florida; and Charlotte County, Florida.

Table 5.

Demographic Components of Population Change for Coastline Counties by State: 2000 to 2008

Area	Total change, 2000 to 2008	Population		Components of change			
				Natural increase	Net migration		
		2000	2008		Total	International	Domestic
United States	**22,635,122**	**281,424,602**	**304,059,724**	**14,124,166**	**8,114,516**	**8,114,516**	**(X)**
Coastline counties	**5,299,082**	**82,124,751**	**87,423,833**	**4,451,235**	**387,565**	**3,909,337**	**–3,521,772**
Atlantic	**2,369,421**	**39,215,378**	**41,584,799**	**1,724,696**	**192,580**	**1,844,385**	**–1,651,805**
Gulf of Mexico	**1,363,026**	**12,557,638**	**13,920,664**	**647,975**	**622,882**	**407,186**	**215,696**
Pacific	**1,566,635**	**30,351,735**	**31,918,370**	**2,078,564**	**–427,897**	**1,657,766**	**–2,085,663**
Maine	30,546	682,811	713,357	9,069	24,355	3,320	21,035
New Hampshire	19,993	277,357	297,350	12,241	9,199	1,666	7,533
Massachusetts	96,955	3,317,775	3,414,730	104,983	–47,558	110,161	–157,719
Rhode Island	2,469	1,048,319	1,050,788	24,100	–16,268	24,945	–41,213
Connecticut	49,690	2,120,754	2,170,444	76,296	–15,451	73,577	–89,028
New York	495,476	11,686,026	12,181,502	655,770	–587,880	793,095	–1,380,975
New Jersey	113,682	4,365,812	4,479,494	181,485	–61,436	232,731	–294,167
Delaware	89,497	783,595	873,092	36,658	56,652	14,270	42,382
Maryland	150,365	2,761,173	2,911,538	91,910	33,970	27,874	6,096
Virginia	222,754	2,827,963	3,050,717	216,073	16,042	80,752	–64,710
North Carolina	116,486	792,620	909,106	38,447	77,877	–490	78,367
South Carolina	135,642	742,279	877,921	34,691	102,013	10,232	91,781
Georgia	36,311	439,453	475,764	30,339	7,960	2,043	5,917
Florida	1,585,488	12,286,141	13,871,629	248,993	1,354,218	582,384	771,834
Alabama	40,490	540,258	580,748	20,310	22,292	4,328	17,964
Mississippi	–14,701	363,995	349,294	15,874	–27,439	950	–28,389
Louisiana	–184,470	1,610,620	1,426,150	56,477	–311,458	11,796	–323,254
Texas	745,774	5,126,065	5,871,839	518,955	178,374	277,937	–99,563
California	1,025,473	24,135,822	25,161,295	1,758,065	–664,341	1,497,924	–2,162,265
Oregon	32,198	611,674	643,872	1,639	33,548	7,243	26,305
Washington	387,797	3,863,187	4,250,984	192,579	200,212	116,786	83,426
Alaska	44,507	529,514	574,021	49,534	–2,351	4,496	–6,847
Hawaii	76,660	1,211,538	1,288,198	76,747	5,035	31,317	–26,282
Noncoastline counties	**17,336,040**	**199,299,851**	**216,635,891**	**9,672,931**	**7,726,951**	**4,205,179**	**3,521,772**

(X) Not applicable.

Note: Data for 2000 represent the April 1 estimates base, which reflects changes to the Census 2000 population from the Count Question Resolution program and geographic program revisions. Population change includes estimates of the population derived using a residual method. More information on the Population Estimates Program's methodology for producing population estimates for counties is available at <www.census.gov/popest/topics/methodology/2008-st-co-meth.html>.

Source: U.S. Census Bureau, Population Estimates Program: 2008.

In addition, the independent city of Virginia Beach, Virginia (not shown in Table 4), had a population increase of 5,300 percent between 1960 and 2008, reflecting the 1963 consolidation of Princess Anne County (1960 population of 76,100) with Virginia Beach independent city (1960 population of 8,100). Overall, of the 20 largest percentage growers, 12 were in Florida, 3 were in Virginia, 2 were in Alaska, and 1 each in Louisiana, North Carolina, and Maryland.

DEMOGRAPHIC COMPONENTS OF CHANGE

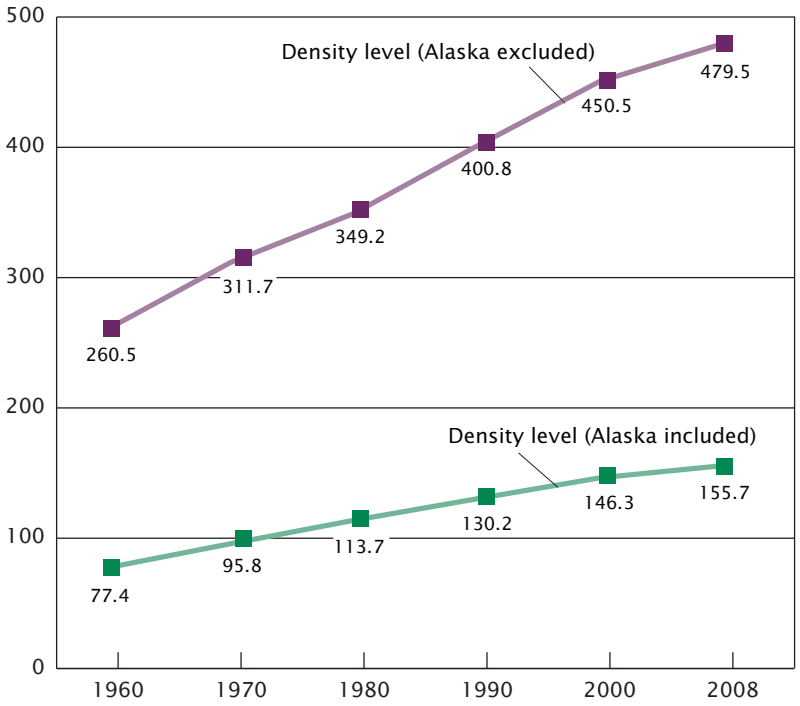
Population growth and decline for counties during a given time can be attributed to several different processes: (1) natural increase (more births than deaths) or natural decrease (more deaths than births); (2) net domestic migration (the difference between *in*migration from elsewhere in the country and *out*-migration); and (3) net international migration (movement to and from abroad). This section will examine these demographic components of change for the 2000 to 2008 period for coastline regions and coastline portions of coastline states.

Natural increase was the largest contributor to population change, accounting for 84 percent (4.5 million of 5.3 million) of the total population change along the coastlines between 2000 and 2008 (Table 5). All coastline regions experienced positive natural increase. Net international migration to coastline counties numbered 3.9 million, but overall net migration

was offset by net domestic outmigration of 3.5 million, primarily from California and New York. The Atlantic and Gulf of Mexico regions had net inmigration, while the Pacific region experienced net outmigration.

Natural increase was the norm for all coastline portions of the 23 coastline states and was a larger contributor to population change than net migration in 15 of those states. Net outmigration occurred along the coastlines of states stretching from Massachusetts through New Jersey as well as Mississippi, Louisiana, California, and Alaska. Coastline Florida's total net migration (1.4 million) accounted for 85 percent of its coastline growth and was at least 1.1 million people higher than total net migration in all other portions of coastline states. The coastline section of North Carolina was the only section to have negative net international migration, reflecting movement overseas of Armed Forces based in Onslow County (location of Marine Corps Air Station New River and Marine Corps Base Camp Lejeune).

Figure 3.
Population Density for Coastline Counties: 1960 to 2008
(Average number of people per square mile of land area)



Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

POPULATION DENSITY

Population density is the measurement of the number of people in an area, frequently expressed as the average number of people per square mile. Excluding Alaska, whose sizable coastline area (over 10 times as large as any other state coastline portion and accounting for 70 percent of the total U.S. coastline land area) heavily affects national density statistics, the average density of coastline counties was 260 people per square mile in 1960 and increased steadily each decade to 480 people per square mile in 2008 (Figure 3). Including Alaska, the population density shows a less dramatic increase, growing from 77 people per square mile in 1960 to 156 people per square mile in 2008.

Coastline counties, which are many of the country's densest counties, are, on average, twice as dense as noncoastline counties (Table 6). Among the coastline states, only the coastline sections of New York, between 1970 and 1980, Louisiana, between 1980 and 1990 and between 2000 and 2008, and Mississippi between 2000 and 2008 had decreases in population density.

Coastline sections of northeastern states are by far the densest. In 2008, of the 7 northeastern coastline states, 4 (Massachusetts, Rhode Island, New York, and New Jersey) had a coastline population density above 1,000 people per square mile, and Connecticut's coastline population density was close behind, at 959 people per square mile. These five states also had the five densest coastline portions of all coastline states.

The 4 densest coastline counties—New York (Manhattan), Kings (Brooklyn), Bronx, and Queens—constitute 4 of New York City's 5 boroughs (Table 7). The fifth borough, Staten Island (Richmond County), more than doubled in density between 1960 and 2008, and moved from sixteenth to eighth densest in that time. Furthermore, in both 1960 and 2008, 10 of

Table 6.
Population Density for Coastline Counties by State: 1960 to 2008
(Average number of people per square mile of land area)

Area	Year						Change, 1960 to 2008	
	1960	1970	1980	1990	2000	2008	Number	Percent
United States	**50.5**	**57.5**	**64.2**	**70.5**	**79.7**	**86.1**	**35.6**	**70.4**
Coastline counties	**77.4**	**95.8**	**113.7**	**130.2**	**146.3**	**155.7**	**78.3**	**101.2**
Maine	56.5	59.8	70.5	80.1	87.8	91.7	35.2	62.2
New Hampshire	142.6	200.0	274.0	353.9	399.3	428.0	285.5	200.3
Massachusetts	961.3	1,059.5	1,085.5	1,146.0	1,228.1	1,264.0	302.7	31.5
Rhode Island	831.4	915.8	916.2	970.6	1,014.0	1,016.4	185.0	22.3
Connecticut	701.9	832.0	855.4	897.0	937.1	959.0	257.1	36.6
New York	5,469.2	5,875.4	5,462.1	5,598.1	6,053.5	6,310.3	841.1	15.4
New Jersey	995.6	1,134.9	1,159.4	1,212.3	1,321.6	1,355.6	360.0	36.2
Delaware	229.0	281.2	304.9	341.8	402.0	447.9	219.0	95.6
Maryland	366.8	415.3	434.4	467.5	499.8	527.0	160.3	43.7
Virginia	248.3	336.0	394.5	498.7	566.9	611.6	363.3	146.3
North Carolina	51.2	55.3	65.3	78.7	91.9	105.3	54.2	105.9
South Carolina	78.4	85.8	103.4	120.8	144.2	170.5	92.1	117.5
Georgia	95.3	100.2	116.3	137.7	156.5	169.5	74.3	78.0
Florida	129.1	181.4	258.0	338.9	413.6	467.0	337.9	261.6
Alabama	128.9	133.6	157.3	169.2	191.6	206.0	77.1	59.8
Mississippi	106.8	135.5	169.6	176.4	205.6	197.3	90.5	84.8
Louisiana	142.7	165.9	188.7	185.6	192.8	170.7	28.0	19.6
Texas	157.8	197.4	259.8	295.4	351.0	402.0	244.2	154.7
California	351.2	448.4	516.1	623.3	691.7	721.1	369.9	105.3
Oregon	23.6	27.1	34.3	35.0	38.9	40.9	17.3	73.4
Washington	98.8	124.2	146.5	178.5	213.6	235.1	136.3	138.1
Alaska	0.4	0.6	0.9	1.2	1.4	1.5	1.1	269.4
Hawaii	98.4	119.6	150.1	172.4	188.5	200.4	102.0	103.6
Noncoastline counties	**44.9**	**49.8**	**54.8**	**59.2**	**67.1**	**72.9**	**28.0**	**62.4**

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.
Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

the 20 densest coastline counties were part of the current New York metropolitan statistical area (metro area). The only Pacific county on the "Top 20" list in 1960 was San Francisco County, California, which is the second smallest county in land area in the Pacific region (behind Kalawao County, Hawaii) and coextensive with the city of San Francisco. Other counties containing large cities on the list in 1960 included Suffolk County, Massachusetts (Boston); Baltimore city, Maryland; and Orleans Parish, Louisiana (New Orleans). The other 6 counties rounding out the Top 20 in 1960 were small independent cities of Virginia.

Table 7.
Coastline Counties by Highest Population Density: 1960 and 2008

(Average number of people per square mile of land area)

County and state	Coastline region	Density
1960		
New York County, NY	Atlantic	74,551.4
Kings County, NY	Atlantic	37,103.8
Bronx County, NY	Atlantic	33,843.6
Queens County, NY	Atlantic	16,554.6
San Francisco County, CA	Pacific	15,795.1
Suffolk County, MA	Atlantic	13,615.4
Hudson County, NJ	Atlantic	13,219.4
Baltimore city, MD	Atlantic	11,600.0
Essex County, NJ	Atlantic	7,317.5
Portsmouth city, VA	Atlantic	6,376.3
Suffolk city, VA	Atlantic	6,304.5
Norfolk city, VA	Atlantic	5,650.7
Union County, NJ	Atlantic	4,902.3
Nassau County, NY	Atlantic	4,569.2
Virginia Beach city, VA	Atlantic	4,045.5
Richmond County, NY	Atlantic	3,803.2
Orleans Parish, LA	Gulf of Mexico	3,704.0
Westchester County, NY	Atlantic	1,878.9
Hampton city, VA	Atlantic	1,736.2
Newport News city, VA	Atlantic	1,662.9
2008		
New York County, NY	Atlantic	71,764.5
Kings County, NY	Atlantic	36,105.0
Bronx County, NY	Atlantic	33,061.8
Queens County, NY	Atlantic	20,977.1
San Francisco County, CA	Pacific	17,260.0
Hudson County, NJ	Atlantic	12,887.9
Suffolk County, MA	Atlantic	12,606.4
Richmond County, NY	Atlantic	8,350.3
Baltimore city, MD	Atlantic	7,868.1
Essex County, NJ	Atlantic	6,106.3
Union County, NJ	Atlantic	5,087.0
Nassau County, NY	Atlantic	4,750.0
Norfolk city, VA	Atlantic	4,327.0
Orange County, CA	Pacific	3,807.8
Pinellas County, FL	Gulf of Mexico	3,324.4
Portsmouth city, VA	Atlantic	2,988.0
Hampton city, VA	Atlantic	2,830.1
Newport News city, VA	Atlantic	2,627.9
Fairfax County, VA	Atlantic	2,597.6
Middlesex County, NJ	Atlantic	2,554.7

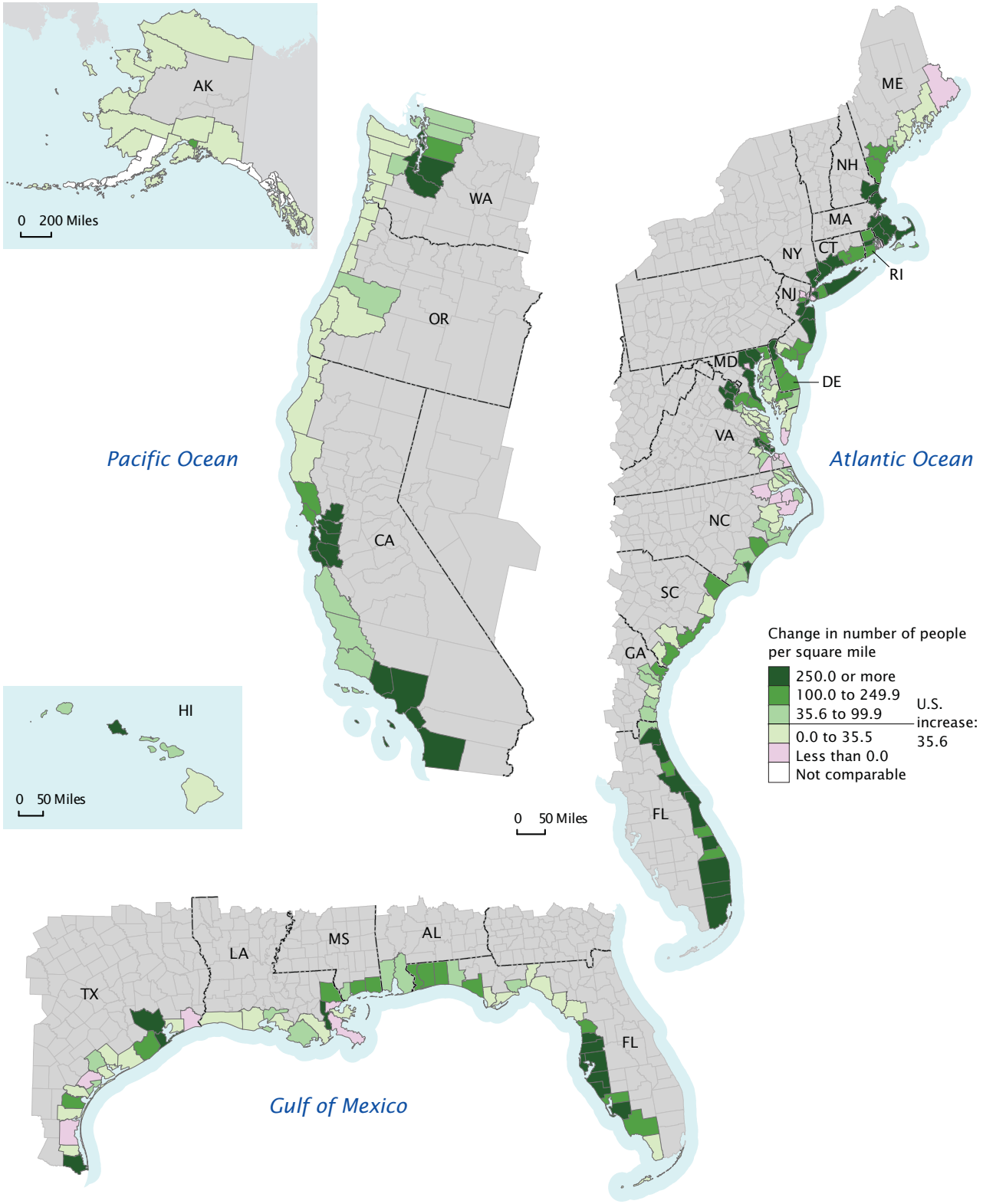
Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960; Population Estimates Program: 2008.

Aside from some shifts in rankings, differences in the list of densest coastline counties in 1960 and 2008 include the addition of Orange County, California, and Pinellas County, Florida, while Orleans Parish, Louisiana, and Westchester County, New York, dropped off the list. Given these changes, the Atlantic region retained 17 of the 20 densest counties (compared to 18 in 1960), while the Pacific had 2, and the Gulf of Mexico had 1. Between 1960 and 2008, some of the densest counties (New York County, New York; Kings County, New York; and Bronx County, New York) decreased somewhat in density, while the threshold for making the Top 20 increased from 1,660 to over 2,500 people per square mile.

Reflecting well-known trends in post-World War II suburbanization and central city population decline, some of the densest counties of the Atlantic region decreased in population density between 1960 and 2008 while counties in close proximity to those dense counties increased in population density. For example, counties surrounding Suffolk, Massachusetts (Boston), Baltimore city, Maryland, and Washington, DC, all saw increases of more than 250 people per square mile (Figure 4). In the southern Atlantic, Gulf of Mexico, and Pacific, counties both surrounding and containing large cities such as Jacksonville, Miami, Tampa, Houston, San Diego, Los Angeles, San Francisco, Seattle, and Honolulu had large increases in population density. This increasing density has contributed to an increase in the size of core urban areas and, as a result, an increase in the number of metro area counties along the coast.

Figure 4.

Change in Population Density for Coastline Counties: 1960 to 2008



Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960; Population Estimates Program: 2008.

POPULATION TRENDS BY CORE BASED STATISTICAL AREA STATUS

The 1960 coastline population was predominantly metropolitan, with 87 percent of coastline residents living in metro area counties (Table 8). But most counties of the coastlines were not in standard metropolitan statistical areas. For example, along the Atlantic and Gulf of Mexico, except for a swath of counties from New Hampshire through northern New Jersey, only a handful of counties were metropolitan (Figure 5). No coastline counties in North Carolina or Mississippi were metropolitan at that time. The Pacific coastline was similar, with large portions of counties outside metro areas and no metro area counties in Alaska. However, in 2008, metro and micro area counties present almost unbroken bands along the country's coastline perimeter. This transition came about as all coastline counties that were metropolitan in 1960 continued to be so in 2008, and new metro area counties began filling in most of the space between the older metro area counties. In addition to metro areas, there are now micro areas, introduced in 2003, accounting for a number of counties that do not belong to metro areas. In Figure 5, these bands of metro and micro area counties are especially noticeable from southern Maine through northern Virginia; from the outer banks of North Carolina around the peninsula of Florida; from the Florida panhandle to the southern tip of Texas; and from southern California to the middle of the Oregon coast.

This increase in the number of coastline counties in metro areas reflects increased county population and population density as well as social and economic integration among those counties. In 1960, 87 percent of the coastline

Table 8.
Coastline Population by Metropolitan Area Status: 1960 and 2008

Area	Number (in millions)		Percent	
	1960	2008	1960	2008
United States	**179.3**	**304.1**	**100.0**	**100.0**
Inside metro area	114.4	254.2	63.8	83.6
Outside metro area	64.9	49.9	36.2	16.4
Coastline counties	**47.4**	**87.4**	**100.0**	**100.0**
Inside metro area	41.0	83.6	86.5	95.6
Outside metro area	6.4	3.8	13.5	4.4
Noncoastline counties	**131.9**	**216.6**	**100.0**	**100.0**
Inside metro area	73.3	170.6	55.6	78.7
Outside metro area	58.5	46.1	44.4	21.3

Note: Standard metropolitan statistical areas defined by the U.S. Bureau of the Budget as of November 1960. Metropolitan statistical areas defined by the U.S. Office of Management and Budget (OMB) as of November 2007. For the 2008 data, the "outside metro area" category includes both micro areas and territory outside of metro and micro areas defined by OMB as of November 2007.

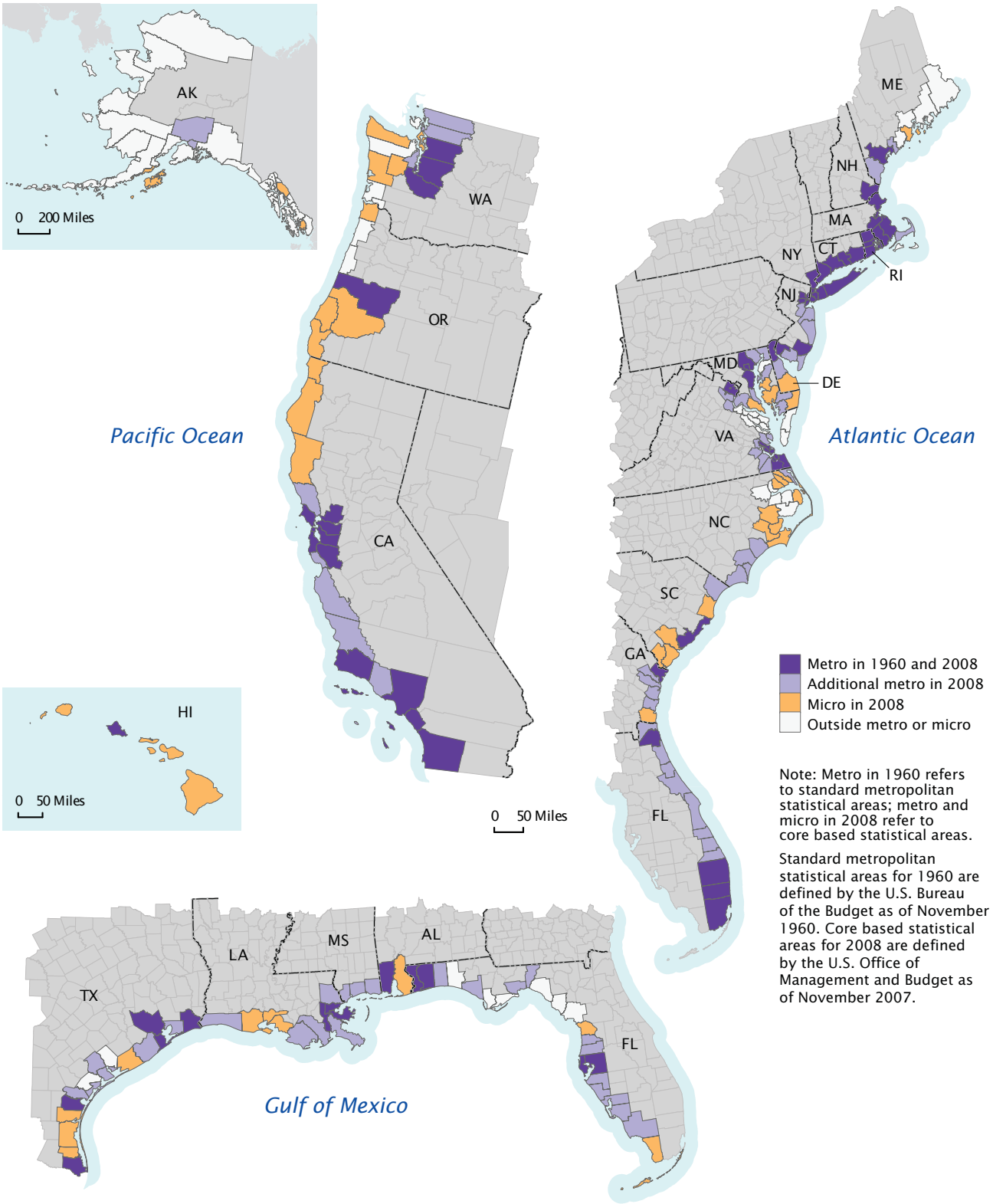
Source: U.S. Census Bureau.

STATISTICAL AREA DEFINITIONS

Standard definitions of metropolitan areas were first issued by the U.S. Bureau of the Budget (predecessor of the U.S. Office of Management and Budget [OMB]), under the designation "standard metropolitan area" (SMA), for use in the 1950 census. From that time forward, OMB (or its predecessor) has reviewed the statistical area standards and, if called for, modified them in the period preceding their application to new Census Bureau decennial data. The term was changed to "standard metropolitan statistical area" (SMSA) in the standards developed for the 1960 census. The 2000 OMB standards provide for metropolitan and micropolitan statistical areas (metro and micro areas), collectively referred to as "core based statistical areas" (CBSAs). These geographic entities are defined for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics. A metro area contains a core urban area population of 50,000 or more. A micro area contains a core urban area population of at least 10,000 (but less than 50,000). Each metro or micro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban area. A metro or micro area's geographic delineation, or list of geographic components at a particular point in time, is referred to as its definition. During the period examined in this report, there have been modifications in statistical area definitions, such as the qualification of new metro areas, changes to the definitions of some existing metro areas, and since the application of the 2000 OMB standards to Census 2000 data, the qualification of micro areas. This report uses two sets of statistical area definitions. For 1960, SMSAs are as defined by the Bureau of the Budget as of November 1960; and, for 2008, CBSAs are as defined by OMB as of November 2007.

Figure 5.

Standard Metropolitan Statistical Area and Core Based Statistical Area Status for Coastline Counties: 1960 and 2008



Note: Metro in 1960 refers to standard metropolitan statistical areas; metro and micro in 2008 refer to core based statistical areas.

Standard metropolitan statistical areas for 1960 are defined by the U.S. Bureau of the Budget as of November 1960. Core based statistical areas for 2008 are defined by the U.S. Office of Management and Budget as of November 2007.

population was metropolitan, compared to 64 percent for the nation and 56 percent for noncoastline counties. In 2008, the percentage of the coastline county population that belonged to a metro area increased to 96 percent, compared to 84 percent for the nation and 79 percent for the nation's noncoastline counties. When including the population of micro areas, the total percentage in core based statistical areas in 2008 stood at 99 percent for coastline counties, compared to 94 percent for the country and 92 percent for noncoastline counties (Appendix Table B).

HOUSING TRENDS

The number of housing units along the coastline increased in recent decades, from 16.1 million in 1960 to 36.3 million in 2008 (Appendix Table C). During this period, the Atlantic coastline region gained the largest number of housing units (8.8 million), followed by the Pacific (6.8 million) and the Gulf of Mexico (4.5 million) (Table 9). During the 1960s, the Atlantic and Pacific each gained 1.5 million housing units, but since 1970, the Atlantic region has been the largest numeric gainer. Since 1960, coastline counties have consistently added at least 3 million housing units each decade—with a peak increase in the 1970s of 5.7 million—and their gain has always been smaller than that for noncoastline counties.

Between 1960 and 2008, the percentage increase in housing units along the coastline (126 percent) was greater than that of the United States (121 percent) or for noncoastline counties (120 percent). Among the coastline regions, the total percentage increases in the Gulf of Mexico (246 percent) and the Pacific (130 percent) far outpaced the gains for the Atlantic region (98 percent). Housing unit growth along the Gulf of Mexico soared to just under 60 percent in the 1970s and consistently maintained higher percentage increases in housing units than the nation, the overall coastline, and noncoastline counties (except in the 1990s), with double-digit percentage increases in all periods.

In each of the 23 states with coastline counties, the coastline counties' share of the state's housing units has fluctuated in recent decades, from a high of 52 percent in 1970 to a low of 48 percent in 2008 (Table 10). Between 1960 and 2008, the U.S. coastline share of housing units increased in 11 states and declined in 9. Some of the largest percentage-point increases were along the Atlantic, where Maine's and New Hampshire's coastline shares of their total housing units increased by 4 percentage points. Virginia's share increased by 5 percentage points, and South Carolina's by 6 percentage points.

Table 9.
Housing Unit Change in Coastline and Noncoastline Counties: 1960 to 2008

Area	Period					Change, 1960 to 2008
	1960–1970	1970–1980	1980–1990	1990–2000	2000–2008	
NUMBER (in millions)						
United States	**10.4**	**19.7**	**13.9**	**13.6**	**13.2**	**70.7**
Coastline counties	**3.6**	**5.7**	**4.5**	**3.2**	**3.2**	**20.2**
Atlantic	1.5	2.2	2.0	1.6	1.5	8.8
Gulf of Mexico	0.6	1.4	1.0	0.7	0.9	4.5
Pacific	1.5	2.0	1.5	1.0	0.8	6.8
Noncoastline counties	**6.8**	**14.1**	**9.4**	**10.4**	**9.9**	**50.6**
PERCENT						
United States	**17.7**	**28.7**	**15.7**	**13.3**	**11.4**	**121.3**
Coastline counties	**22.3**	**28.8**	**17.8**	**10.7**	**9.8**	**125.5**
Atlantic	16.9	21.2	15.5	10.6	9.4	98.1
Gulf of Mexico	30.5	58.9	26.2	14.0	16.0	246.3
Pacific	28.5	29.9	17.3	9.3	7.3	129.7
Noncoastline counties	**16.0**	**28.7**	**14.8**	**14.4**	**12.0**	**119.7**

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

Table 10.

Share of Coastline County Housing Units by State: 1960 to 2008

Area	Percentage of state housing units inside coastline counties						Percentage-point change, 1960 to 2008
	1960	1970	1980	1990	2000	2008	
Coastline state total . . .	**51.3**	**51.7**	**50.7**	**50.0**	**48.7**	**47.7**	**–3.7**
Maine	50.9	50.7	51.6	52.2	53.8	54.7	3.8
New Hampshire	17.4	18.9	19.7	20.2	20.7	20.8	3.5
Massachusetts	53.3	52.6	53.2	53.5	53.6	53.6	0.3
Rhode Island	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Connecticut	63.1	62.1	62.5	61.9	61.9	61.8	–1.3
New York	63.3	62.9	60.1	58.9	59.0	59.1	–4.2
New Jersey	56.9	55.2	54.7	54.4	53.8	54.0	–2.9
Delaware	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Maryland	66.5	59.5	57.8	55.5	54.7	54.2	–12.2
Virginia	32.6	34.1	35.5	38.4	37.7	37.5	4.9
North Carolina	9.9	9.9	10.5	11.5	11.4	11.7	1.8
South Carolina	17.4	17.6	18.7	21.2	21.6	23.9	6.4
Georgia	7.1	6.2	6.1	5.9	5.7	5.5	–1.7
Florida	79.5	80.9	80.6	79.4	78.2	77.3	–2.3
Alabama	11.2	10.8	11.3	12.1	12.2	13.2	2.0
Mississippi	9.2	10.9	12.4	12.9	13.1	12.4	3.2
Louisiana	37.3	38.5	38.0	37.4	36.2	30.5	–6.8
Texas	23.7	25.2	27.0	25.4	24.3	24.7	1.0
California	77.8	78.3	74.9	72.2	70.5	68.1	–9.7
Oregon	20.6	20.4	21.3	20.5	19.6	18.9	–1.7
Washington	63.2	66.1	64.6	66.8	66.3	66.4	3.2
Alaska	78.6	82.9	82.6	82.9	84.0	83.5	4.9
Hawaii	100.0	100.0	100.0	100.0	100.0	100.0	0.0

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

COASTLINE COUNTIES AND HURRICANES

Coastline counties along the Atlantic and Gulf of Mexico coasts as well as the Hawaiian Islands account for nearly two-thirds of the nation's coastline population and are home to 4 of the nation's 10 most populous counties. These counties are also vulnerable to one of nature's biggest threats: hurricanes. The following section utilizes data from NOAA to examine how hurricanes have affected the coastline population from 1960 to 2008.

The hurricane data for this section come from NOAA's Coastal Services Center, Historical Hurricane Tracks Web site (NOAA, 2009). Storm track data for both basins (Atlantic and Pacific) were restricted to include only tracks for hurricanes (Categories 1 through 5) that occurred during or after 1960. The hurricane paths were then superimposed onto a map of U.S. counties, and a radius was applied to each path to simulate an area each hurricane may have affected (Appendix Figure A). Coastline counties were regarded as experiencing a direct hit if they were within or crossed by the boundary of the simulated area. Based on these data, between 1960 and 2008, the total number of hurricanes affecting coastline counties was 86.

Sections of the North Carolina, Florida, Alabama, and Louisiana coastlines have experienced the most hurricanes since 1960 (Figure 6). North Carolina, though farther north than Louisiana and Florida, is especially susceptible to hurricanes due to its barrier islands that extend east into the Atlantic Ocean. In contrast, coastline counties of all northeastern states, as well as Delaware, Maryland, Virginia, Georgia, and Hawaii experienced relatively few hurricanes, with only Suffolk County, New York, and Nantucket County, Massachusetts, experiencing more than three hurricanes between 1960 and 2008. This pattern is attributable in part to Georgia's small coastline and the curvature of the U.S. coastline, which situates Georgia farther to the west than the coastlines of Florida and North Carolina. Coastline counties north of North Carolina also have two natural buffers against hurricanes. First, a hurricane will most likely have already made landfall before reaching these counties, and second, a hurricane that has not made landfall will have traveled over the cooler waters north of Florida, thus potentially reducing the hurricane to a tropical storm.

WHAT IS A HURRICANE?

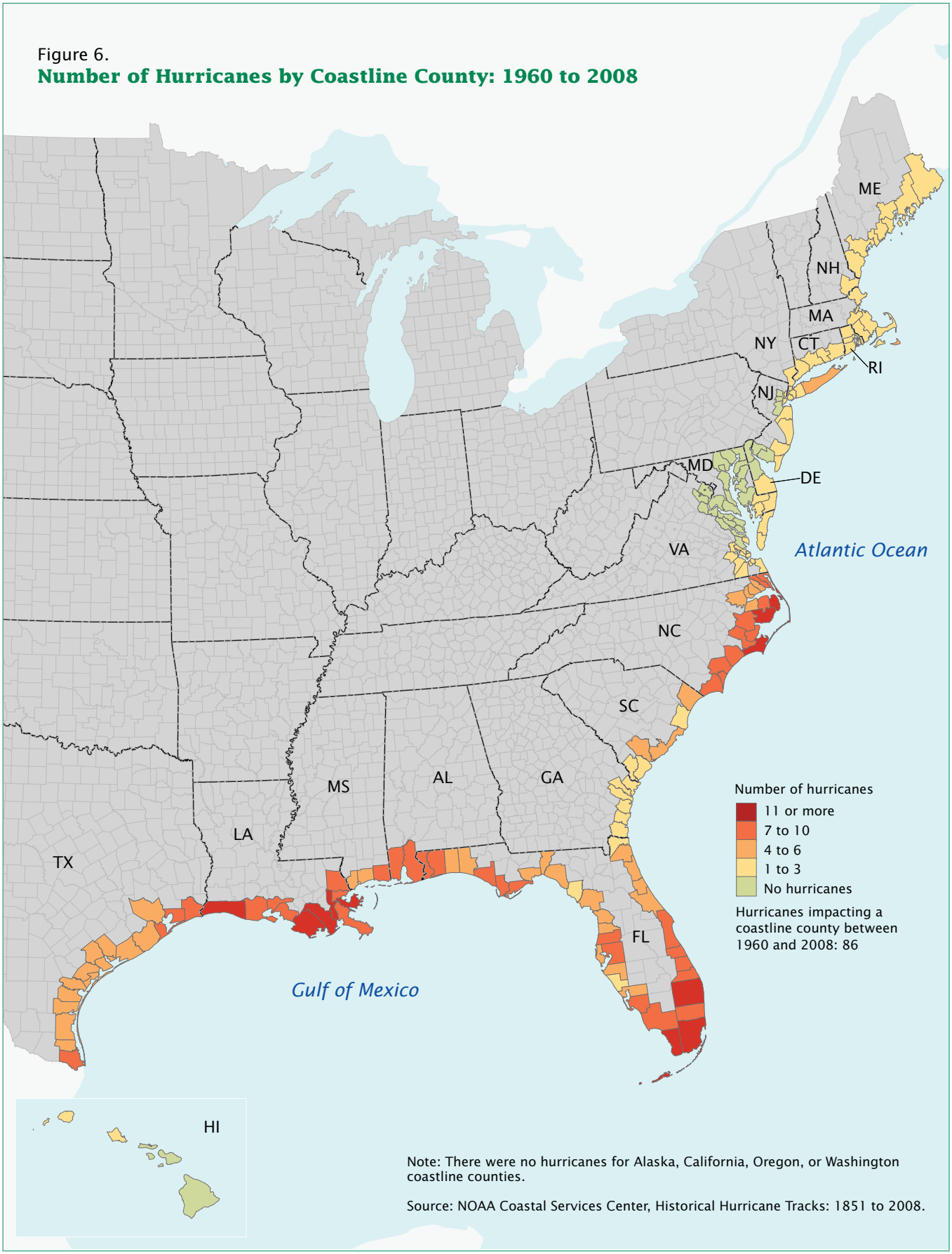
A type of tropical cyclone, a hurricane is an "intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph...or higher" (NOAA, 1999). Hurricanes form in both the Atlantic and the northeast Pacific basins. The term "hurricane" was derived from the Spanish and Caribbean Indian words for evil spirits and big winds (NOAA, 1999).

The Saffir-Simpson Hurricane Scale defines hurricane strength by categories, with Category 1 storms the weakest (74–95 mph) and Category 5 the strongest (winds greater than 155 mph). The category of the storm is not directly related to the damage the storm may cause (NOAA, 1999). "Frequently, the right side of a hurricane is the most dangerous in terms of storm surge, winds, and tornadoes" (NOAA, 1999).

Hurricanes in the northeast Pacific almost never hit the U.S. coastline because hurricanes tend to move in a west-northwest direction after forming. In the Atlantic, this motion often brings hurricanes to Atlantic and Gulf of Mexico coastline counties. In the northeast Pacific, a west-northwest track pushes hurricanes farther offshore, away from continental Pacific coastline counties. Also, along the country's west coast, ocean temperatures rarely get above the lower 70s. These cool temperatures are not warm enough to sustain a hurricane's strength (Landsea, 2007).

Figure 6.

Number of Hurricanes by Coastline County: 1960 to 2008



Note: There were no hurricanes for Alaska, California, Oregon, or Washington coastline counties.

Source: NOAA Coastal Services Center, Historical Hurricane Tracks: 1851 to 2008.

Table 11.
Coastline Counties Most Frequently Hit by Hurricanes: 1960 to 2008

Rank	County and state	Coastline region	Number of hurricanes	Percent change in population		Percent change in housing units	
				1960 to 2008	2000 to 2008	1960 to 2008	2000 to 2008
1	Monroe County, FL	Gulf of Mexico	15	50.8	–9.2	221.8	4.3
2	Lafourche Parish, LA	Gulf of Mexico	14	67.2	2.9	151.5	8.9
2	Carteret County, NC	Atlantic	14	104.3	6.4	366.4	12.4
4	Dare County, NC	Atlantic	13	465.9	12.1	709.6	22.8
4	Hyde County, NC	Atlantic	13	–10.1	–11.1	83.7	5.8
6	Jefferson Parish, LA	Gulf of Mexico	12	108.9	–4.2	201.4	–3.5
6	Palm Beach County, FL	Atlantic	12	454.7	11.9	616.9	15.2
8	Miami-Dade County, FL	Atlantic	11	156.5	6.4	180.6	14.9
8	St. Bernard Parish, LA	Gulf of Mexico	11	17.2	–43.9	–2.6	–67.9
8	Cameron Parish, LA	Gulf of Mexico	11	4.8	–27.6	87.7	–8.1
8	Terrebonne Parish, LA	Gulf of Mexico	11	78.7	3.9	179.4	11.0

Source: NOAA, Coastal Services Center, Historical Hurricane Tracks: 1851 to 2008.

Of the coastline counties most frequently hit by hurricanes, only one, Hyde County, North Carolina, had an overall decrease in population between 1960 and 2008 (Table 11). Furthermore, only one, St. Bernard Parish, Louisiana, experienced an overall decrease in housing units between 1960 and 2008. On average, the 11 coastline counties that were hit by 11 or more hurricanes between 1960 and 2008 increased in population by nearly 179 percent and had a housing unit increase of 255 percent.

Closer examination reveals that these 11 counties did not grow consistently throughout the 48-year period. Between 2000 and 2008, 5 of the 11 counties decreased in population due largely to net outmigration (more people moving out of, rather than into, these 5 counties during that time). All 5 counties were hit by some of the most intense hurricanes since 1960.[2]

The 10 most intense hurricanes since 1960 affected nearly 51 million people living in coastline counties. If those same 10 hurricanes had struck in 2008, the coastline population affected would have been closer to 70 million.

Coastline counties hit by Hurricane Donna (1960) have seen the greatest population growth (116 percent) from the time the area was hit (Figure 7). Florida's coastline counties affected by Hurricane Donna were some of the nation's fastest-growing counties between 1960 and 2008. Coastline counties affected by Hurricane Carla (1961) may not have seen the most dramatic increase in numeric growth between 1960 and 2008, but this collection of counties grew by 90 percent, nearly doubling in population from 464,000 in 1960 to 882,000 in 2008.

Hurricane Gloria (1985) affected the largest population (17 million) at the time it struck. This large population included residents of New York City's five boroughs; Boston, Massachusetts; Bridgeport, Connecticut; New Haven, Connecticut; and Providence, Rhode Island. The population affected by Hurricane Gloria in 1985 was larger than that of Hurricane Donna in 1960 (11 million), but by 2008, the population of Hurricane Donna's affected area (24 million) surpassed that of Hurricane Gloria (19 million).

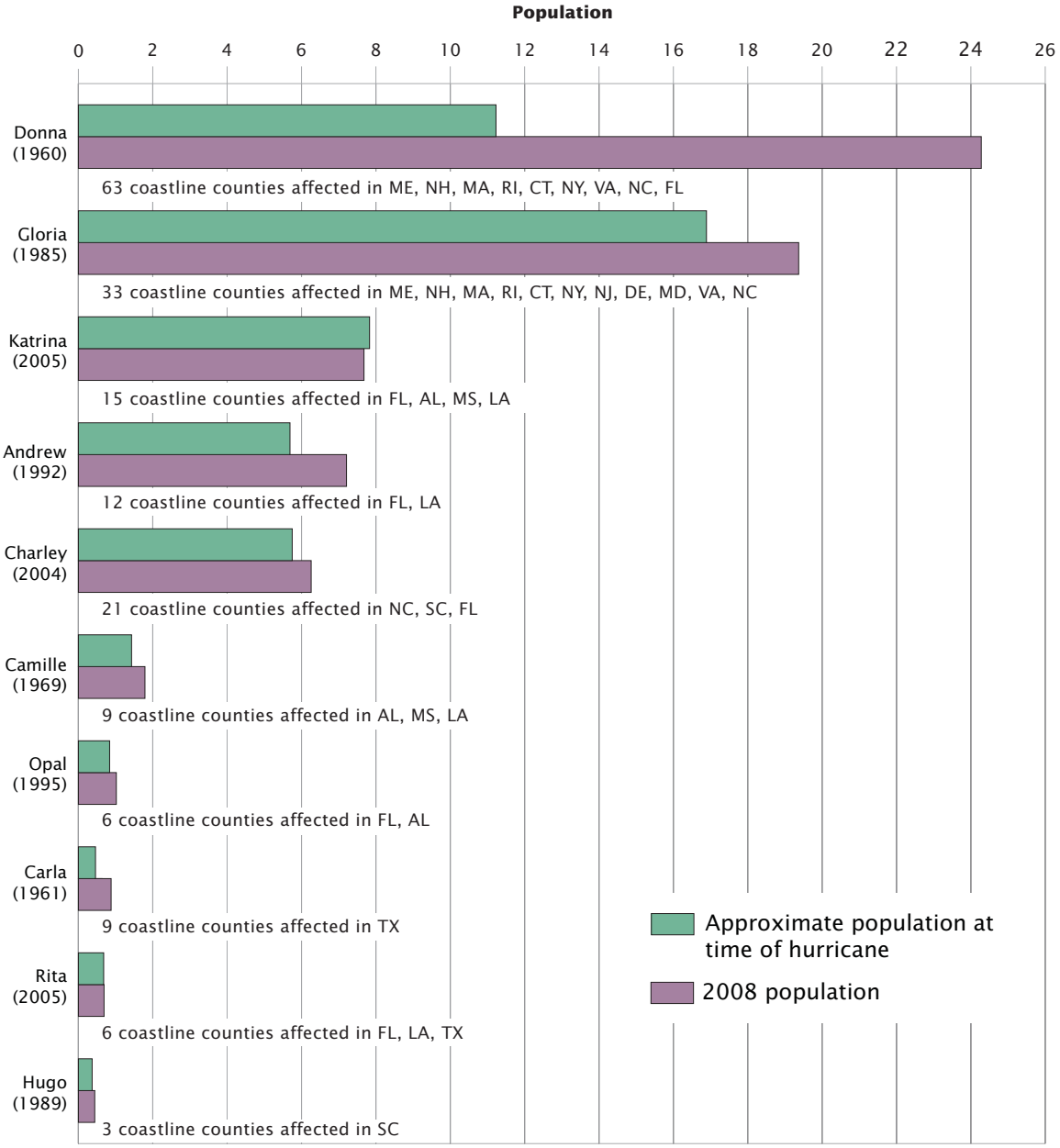
Of the 10 most intense hurricanes between 1960 and 2006, only the coastline counties affected by Hurricane Katrina (2005) had an overall decrease in population (nearly 2 percent loss). The populations in coastline counties affected by Hurricanes Andrew (1992) and Opal (1995) have each grown by more than 20 percent in the decades since they hit. In contrast, even though Hurricane Rita (2005) occurred after Hurricane Katrina, the population in coastline counties affected by Hurricane Rita has grown slightly since 2005 (1 percent growth). However, 3 of the 6 coastline counties hit by Hurricane Rita had a lower population in 2008 than in 2005.

[2]List derived from "The Deadliest, Costliest, and Most Intense United States Tropical Cyclones From 1851 to 2006" (Blake, 2007).

Figure 7.

Population in Coastline Counties Affected by the 10 Most Intense U.S. Hurricanes Since 1960

(Sorted by 2008 population in affected area; population in millions)



Notes:
For hurricanes prior to 1980, the population at the time of the hurricane reflects the decennial census population prior to the hurricane.
For hurricanes after 1980, the population at the time of the hurricane reflects the population as of July 1 of that year.

Sources:
Eric S. Blake, Edward N. Rappaport, and Christopher W. Landsea, NOAA/NWS/NCEP/TPC/National Hurricane Center, 2007, "The Deadliest, Costliest, and Most Intense United States Tropical Cyclones From 1851 to 2006."
NOAA Coastal Services Center, Historical Hurricane Tracks:1851 to 2008.
U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

SUMMARY

Between 1960 and 2008, a faster growth in population and housing, a larger increase in population density, and a higher percentage of the population in metro areas distinguished the U.S. coastline from the rest of the country. Social, economic, and environmental factors continue to draw residents to coastline destinations. While the growth in some coastline areas has slowed, most coastline sections continue to flourish. Monitoring these population trends, including the demographic components of change, will reveal whether these patterns continue.

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METHODOLOGY AND SOURCES OF DATA

This report used 100 percent-count decennial census data for the years 1960 through 2000, and estimates of the total population, total housing units, and the components of change for July 1, 2008. The population universe is the resident population of the United States (50 states and the District of Columbia). Migration from outside the United States, including from Puerto Rico and the U.S. Island Areas (American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the U.S. Virgin Islands) and by the U.S. population abroad, was treated as international migration. The methodology used by the Census Bureau's Population Estimates Program to produce population estimates for counties is available at <www.census.gov/popest/topics/methodology/2008-st-co-meth.pdf>. Each component of population change was estimated separately. All derived values were computed using unrounded data. For readability, most whole numbers in the text were rounded to the nearest hundred or thousand, and most decimal numbers were rounded to the nearest whole number. In the tables, whole numbers are unrounded or expressed in millions, and percentages are rounded to the nearest tenth.

ACCURACY AND RELIABILITY OF THE DATA

Potential sources of nonsampling error in the population estimates process include: (1) potential errors (such as differential undercoverage or overcoverage by demographic characteristics) in the enumeration (e.g., Census 2000) that serves as the base of the postcensal estimates; and (2) potential errors in the components of change (such as births, deaths, domestic migration, and net international migration) used to carry forward the population estimates.

FOR MORE INFORMATION

Population estimates at the national, state, county, and city and town levels are produced each year by the Census Bureau's Population Estimates Program and are available at <www.census.gov/popest/estimates.html>. The Population Estimates Program publishes total population estimates each year for the nation, states, counties, and subcounty units (cities and minor civil divisions). For the nation, states, and counties, population estimates also include demographic components of change (births, deaths, and migration) and estimates by age, sex, race, and Hispanic origin. The reference date for population estimates is July 1.

CONTACTS

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USER COMMENTS

The Census Bureau welcomes the comments and advice of users of our data and reports. Please send suggestions or comments to:

Chief, Population Division
U.S. Census Bureau
Washington, DC 20233-8800

Appendix Table A.

Coastline Population by State: 1960 to 2008

Area	Year						Change, 1960 to 2008	
	1960	1970	1980	1990	2000	2008	Number	Percent
United States	**179,323,175**	**203,211,926**	**226,545,805**	**248,709,873**	**281,421,906**	**304,059,724**	**124,736,549**	**69.6**
Coastline counties	**47,448,231**	**56,715,415**	**63,587,555**	**73,048,655**	**82,124,392**	**87,423,833**	**39,975,602**	**84.3**
Atlantic	**26,665,037**	**30,449,628**	**31,943,197**	**35,231,154**	**39,215,349**	**41,584,799**	**14,919,762**	**56.0**
Gulf of Mexico	**5,562,984**	**6,936,997**	**9,149,249**	**10,723,973**	**12,557,407**	**13,920,664**	**8,357,680**	**150.2**
Pacific	**15,220,210**	**19,328,790**	**22,495,109**	**27,093,528**	**30,351,636**	**31,918,370**	**16,698,160**	**109.7**
Maine	439,851	464,883	548,040	623,198	682,814	713,357	273,506	62.2
New Hampshire	99,029	138,951	190,345	245,845	277,359	297,350	198,321	200.3
Massachusetts	2,597,027	2,862,290	2,932,393	3,095,930	3,317,771	3,414,730	817,703	31.5
Rhode Island	859,488	946,725	947,154	1,003,464	1,048,319	1,050,788	191,300	22.3
Connecticut	1,588,514	1,882,926	1,935,906	2,030,017	2,120,734	2,170,444	581,930	36.6
New York	10,557,830	11,341,996	10,544,051	10,806,642	11,685,650	12,181,502	1,623,672	15.4
New Jersey	3,290,028	3,750,347	3,831,213	4,005,994	4,367,129	4,479,494	1,189,466	36.2
Delaware	446,292	548,104	594,338	666,168	783,600	873,092	426,800	95.6
Maryland	2,026,229	2,294,049	2,399,856	2,582,753	2,761,143	2,911,538	885,309	43.7
Virginia	1,325,584	1,683,387	1,967,642	2,487,459	2,827,481	3,050,717	1,725,133	130.1
North Carolina	441,605	477,404	563,609	679,075	792,902	909,106	467,501	105.9
South Carolina	403,667	441,785	532,498	621,683	742,274	877,921	474,254	117.5
Georgia	267,305	281,108	326,382	386,415	439,154	475,764	208,459	78.0
Florida	3,835,751	5,388,107	7,664,458	10,066,203	12,285,697	13,871,629	10,035,878	261.6
Alabama	363,389	376,690	443,536	476,923	540,258	580,748	217,359	59.8
Mississippi	189,050	239,944	300,217	312,368	363,988	349,294	160,244	84.8
Louisiana	1,192,074	1,385,438	1,575,797	1,550,498	1,610,435	1,426,150	234,076	19.6
Texas	2,305,308	2,882,491	3,795,011	4,314,492	5,126,048	5,871,839	3,566,531	154.7
California	12,254,192	15,645,052	18,008,000	21,748,651	24,135,820	25,161,295	12,907,103	105.3
Oregon	371,256	426,780	538,930	550,921	611,645	643,872	272,616	73.4
Washington	1,785,633	2,245,116	2,649,169	3,227,795	3,863,160	4,250,984	2,465,351	138.1
Alaska	176,357	243,281	334,319	457,932	529,474	574,021	397,664	225.5
Hawaii	632,772	768,561	964,691	1,108,229	1,211,537	1,288,198	655,426	103.6
Noncoastline counties	**131,874,944**	**146,496,511**	**162,958,250**	**175,661,218**	**199,297,514**	**216,635,891**	**84,760,947**	**64.3**

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.

Appendix Table B.

Number of Counties and Population by Standard Metropolitan Statistical Area (SMSA) and Core Based Statistical Area (CBSA) Status: 1960 and 2008

Year and area	Counties		Population	
	Number	Percent	Number	Percent
1960				
United States	**3,133**	**100.0**	**179,323,175**	**100.0**
Inside SMSA	361	11.5	114,378,687	63.8
Outside SMSA	2,772	88.5	64,944,488	36.2
Coastline counties	**253**	**100.0**	**47,448,231**	**100.0**
Inside SMSA	77	30.4	41,044,697	86.5
Outside SMSA	176	69.6	6,403,534	13.5
Noncoastline counties	**2,880**	**100.0**	**131,874,944**	**100.0**
Inside SMSA	284	9.9	73,333,990	55.6
Outside SMSA	2,596	90.1	58,540,954	44.4
2008				
United States	**3,142**	**100.0**	**304,059,724**	**100.0**
Inside CBSA	1,786	56.8	284,820,163	93.7
Inside metro area	1,092	34.8	254,189,924	83.6
Inside micro area	694	22.1	30,630,239	10.1
Outside CBSA	1,356	43.2	19,239,561	6.3
Coastline counties	**254**	**100.0**	**87,423,833**	**100.0**
Inside CBSA	199	78.3	86,543,254	99.0
Inside metro area	153	60.2	83,607,489	95.6
Inside micro area	46	18.1	2,935,765	3.4
Outside CBSA	55	21.7	880,579	1.0
Noncoastline counties	**2,888**	**100.0**	**216,635,891**	**100.0**
Inside CBSA	1,587	55.0	198,276,909	91.5
Inside metro area	939	32.5	170,582,435	78.7
Inside micro area	648	22.4	27,694,474	12.8
Outside CBSA	1,301	45.0	18,358,982	8.5

Note: Standard metropolitan statistical areas defined by the U.S. Bureau of the Budget as of November 1960. Metropolitan and micropolitan statistical areas defined by the U.S. Office of Management and Budget as of November 2007.

Source: U.S. Census Bureau.

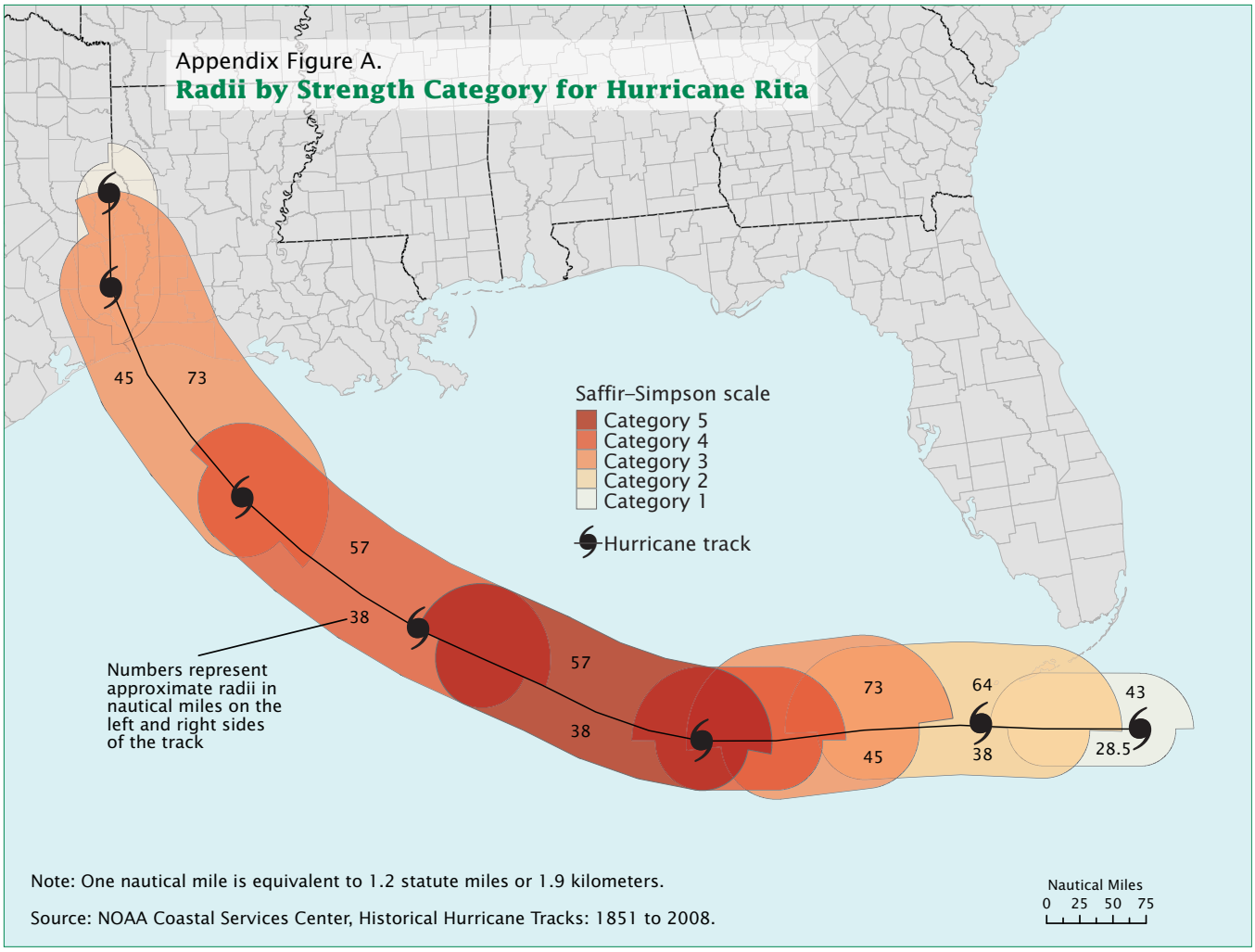
Appendix Table C.

Housing Units for Coastline Counties by State: 1960 to 2008

Area	Year						Change, 1960 to 2008	
	1960	1970	1980	1990	2000	2008	Number	Percent
United States	**58,326,357**	**68,679,030**	**88,411,263**	**102,263,678**	**115,904,641**	**129,065,264**	**70,738,907**	**121.3**
Coastline counties	**16,078,943**	**19,658,915**	**25,325,352**	**29,824,580**	**33,016,371**	**36,250,384**	**20,171,441**	**125.5**
Atlantic	**8,995,564**	**10,520,243**	**12,752,797**	**14,733,411**	**16,294,503**	**17,824,303**	**8,828,739**	**98.1**
Gulf of Mexico	**1,847,208**	**2,411,247**	**3,831,236**	**4,836,648**	**5,516,163**	**6,397,153**	**4,549,945**	**246.3**
Pacific	**5,236,171**	**6,727,425**	**8,741,319**	**10,254,521**	**11,205,705**	**12,028,928**	**6,792,757**	**129.7**
Maine	185,603	201,238	258,566	306,712	350,552	383,142	197,539	106.4
New Hampshire	38,941	53,132	76,115	101,773	113,023	124,237	85,296	219.0
Massachusetts	900,839	994,900	1,175,398	1,321,676	1,404,389	1,466,029	565,190	62.7
Rhode Island	286,757	316,477	372,672	414,572	439,837	451,753	164,996	57.5
Connecticut	516,258	609,107	723,740	817,488	858,157	891,469	375,211	72.7
New York	3,604,093	3,960,411	4,128,835	4,256,505	4,530,831	4,716,123	1,112,030	30.9
New Jersey	1,137,918	1,319,239	1,517,020	1,671,927	1,781,964	1,900,530	762,612	67.0
Delaware	143,725	180,233	238,611	289,919	343,072	392,965	249,240	173.4
Maryland	621,032	743,173	908,602	1,050,271	1,173,433	1,265,341	644,309	103.7
Virginia	381,197	508,667	716,548	959,291	1,095,816	1,240,330	859,133	225.4
North Carolina	131,226	161,681	238,503	323,037	403,252	491,868	360,642	274.8
South Carolina	118,333	143,335	216,033	301,621	377,964	490,676	372,343	314.7
Georgia	83,435	91,540	123,177	156,388	185,664	219,979	136,544	163.7
Florida	1,413,401	2,043,865	3,527,960	4,845,750	5,707,936	6,799,916	5,386,515	381.1
Alabama	108,292	121,244	165,213	202,153	239,386	284,664	176,372	162.9
Mississippi	57,866	76,455	113,126	129,916	152,386	157,088	99,222	171.5
Louisiana	365,261	443,380	588,068	642,713	667,931	574,640	209,379	57.3
Texas	748,595	963,413	1,495,846	1,778,347	1,985,073	2,370,706	1,622,111	216.7
California	4,251,664	5,477,253	6,950,183	8,069,582	8,615,142	9,118,850	4,867,186	114.5
Oregon	128,046	152,125	230,209	244,607	285,363	307,811	179,765	140.4
Washington	638,112	806,782	1,092,217	1,357,785	1,625,464	1,852,782	1,214,670	190.4
Alaska	52,843	75,180	134,475	192,737	219,194	236,604	183,761	347.7
Hawaii	165,506	216,085	334,235	389,810	460,542	512,881	347,375	209.9
Noncoastline counties	**42,247,414**	**49,020,115**	**63,085,911**	**72,439,098**	**82,888,270**	**92,814,880**	**50,567,466**	**119.7**

Note: Data for 1960 to 2000 are as of April 1 of each year; data for 2008 are as of July 1.

Source: U.S. Census Bureau, Decennial Census of Population and Housing: 1960 to 2000; Population Estimates Program: 2008.



Note: One nautical mile is equivalent to 1.2 statute miles or 1.9 kilometers.

Source: NOAA Coastal Services Center, Historical Hurricane Tracks: 1851 to 2008.

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