

Chapter 8

State Indicators

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Chapter Overview

In response to increasing interest in both the policy and research communities about the role of science and technology (S&T) in state and regional economic development, a new experimental chapter devoted to the subject is included in the 2004 edition of *Science and Engineering Indicators*. This chapter focuses on the performance of individual states, the District of Columbia, and Puerto Rico. It introduces a series of indicators designed to present information about various aspects of the state S&T infrastructure and to stimulate discussion about appropriate state S&T indicators. The data used to calculate these indicators have been gathered from both public and private sources. Whenever possible, data covering a 10-year span are provided to identify meaningful trends. However, because consistent data were not always available for the 10-year period, data for certain indicators are given only for the years in which comparisons are justified.

Ready access to accurate and timely state-level information is an important tool for formulating effective S&T policies below the national level. By studying the programs and performance of their peers, state policymakers may be able to assess and enhance their own programs and performance. Hopefully, these indicators will encourage the development of benchmarks that individual states can use to assess their progress in specific areas and to assist in setting realistic goals for improvement. The tables are intended to give the user a convenient listing of some of the quantitative data that may be relevant to technology-based economic development. In addition to describing the behavior of an indicator, the “Findings” section frequently presents an interpretation of the behavior’s relevance and meaning. The interpretation is sometimes speculative, with the objective of motivating further thought and discussion.

Types of Indicators

Twenty-four indicators are included in this chapter and grouped into the following areas:

- ◆ Secondary education
- ◆ Higher education
- ◆ Workforce
- ◆ Financial research and development inputs
- ◆ R&D outputs
- ◆ S&T in the economy

Indicators in the first two areas address educational attainment in a particular state. They focus on student science and mathematics skills at the secondary level, public school teacher salaries, and undergraduate and graduate degrees in S&E.

The workforce indicators focus on the level of S&E training in the employed labor force. These indicators reflect the higher education level of the labor force and the degree of specialization in S&E disciplines and occupations.

Indicators in the financial section address the source and level of funding for R&D. They show how much R&D is being performed relative to the size of a state’s business base. Comparison of these indicators illustrates the extent to which R&D is conducted by industrial or academic performers.

The last two sections, R&D and S&T outputs, quantify the robustness of a region’s S&T activity through measurement of its production of patents and technical publications, venture capital investment, and high-technology business activity. Although data adequately addressing both the quantity and quality of R&D results are difficult to find, these indicators offer a reasonable information base.

Data Sources and Considerations

Raw data for each indicator are presented in the tables. The first entry in each table represents the average value for the states. For most indicators, the state average was calculated by summing the values for the 50 states and the District of Columbia for both the numerator and the denominator and then dividing the two. Any alternate approach is indicated in the notes at the bottom of the table.

The values for most indicators are expressed as ratios or percentages to remove the effect of state size and facilitate comparison between large and small states or between heavily and sparsely populated states. For example, an indicator of higher education achievement is not defined as the absolute number of degrees conferred in a state, because sparsely populated states are not likely to have as extensive a higher education system as states with larger populations. Instead, the indicator is defined as the number of degrees per number of residents in the college-age cohort, which measures the intensity of educational services relative to the size of the resident population.

No official list of high-technology industries or sanctioned methodology to identify the most technology-intensive industries exists in the United States. The definition used here was developed by the Department of Commerce’s Technology Administration in concert with the U.S. Department of Labor’s Bureau of Labor Statistics. See “Technical Note: Defining High-Technology Industries.”

Indicator Pages

A page containing key elements has been created to supplement the data for each indicator. The first element is a map that is color coded to show in which quartile each state placed on that indicator for the latest year that data were available. This helps the reader quickly grasp geographic trends. See the sample map below showing the outline of each state. On the map, the darkest color indicates states ranking in the first or highest quartile, and white indicates states ranking in the fourth or lowest quartile. Cross-hatching indicates states for which no data are available.

The second element is a quartiles table. States falling in a particular quartile are listed alphabetically. The range of indicator values for that quartile is shown at the top of the

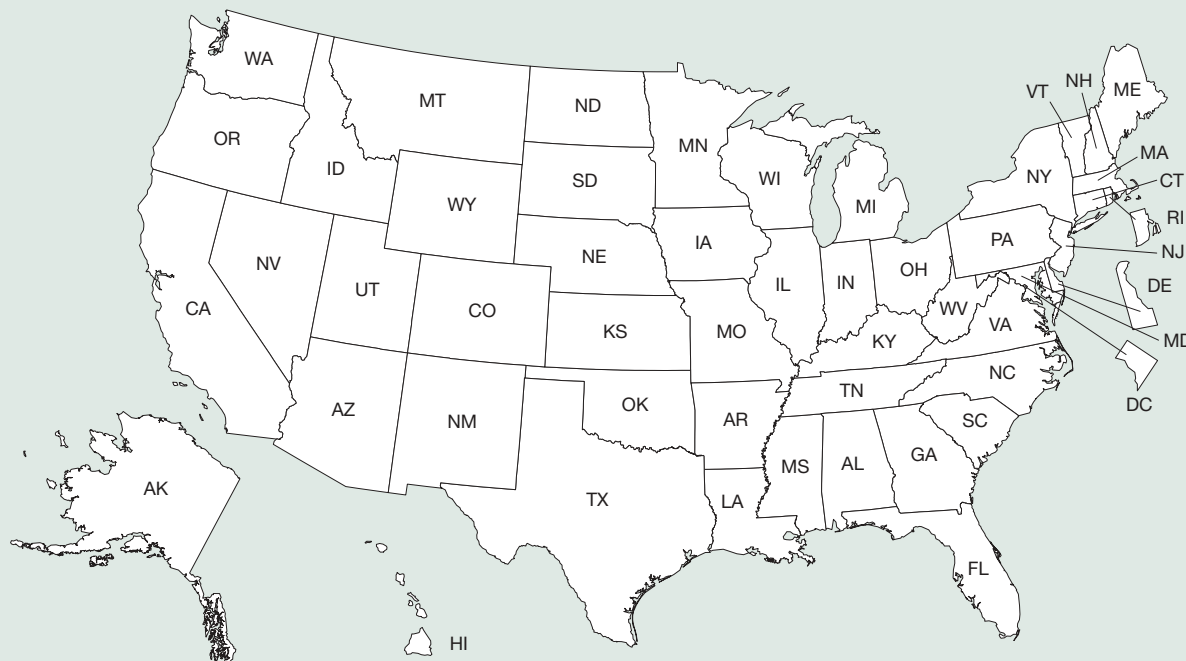
column. Ties at quartile breaks were resolved by moving the tied states into one quartile. All of the indicators are broad measures, and several rely on sample estimates that have a margin of error. Small differences in state values generally carry little useful information.

The third element, on the lower left side of the page, is a short description of the indicator, a brief note about the nature of the data, and other information describing the data.

The fourth element, on the lower right side of the page within a shaded box, is a summary of findings. The findings include the national average and comments on trends and patterns for the particular indicator.

The final element, appearing at the bottom of each page, is a short citation for the data source. The full citation appears on the facing page.

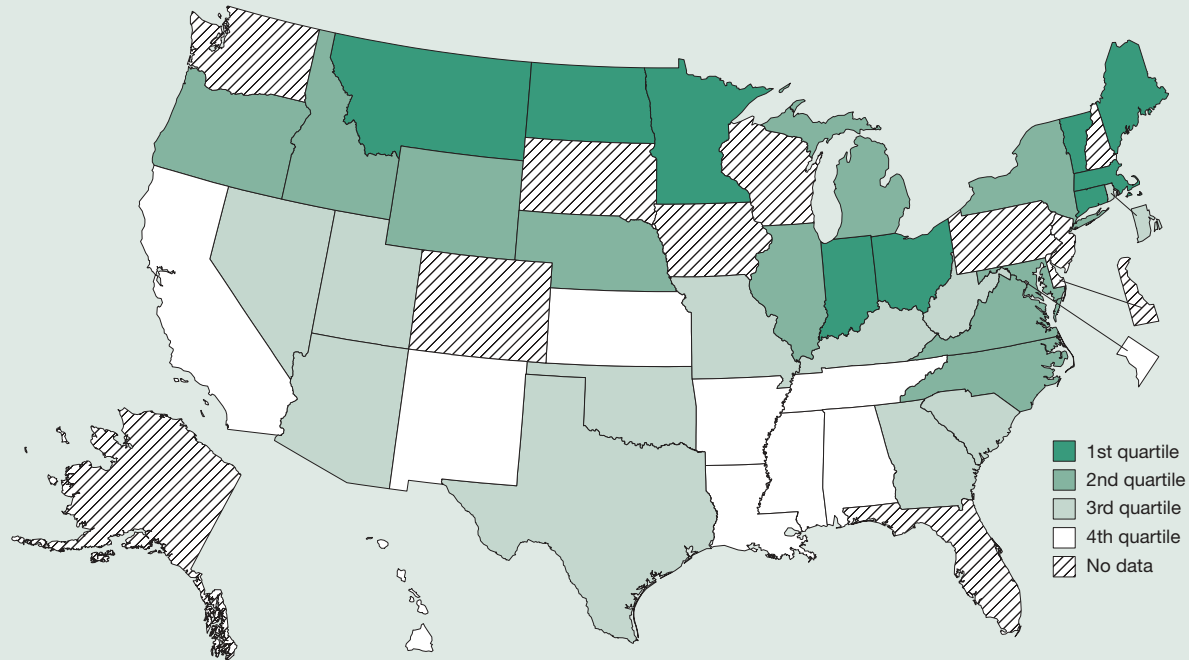
U.S. Map and List of Abbreviations



AK..... Alaska	HIHawaii	ME.....Maine	NJ New Jersey	SDSouth Dakota
AL Alabama	IAIowa	MIMichigan	NM New Mexico	TN Tennessee
AR..... Arkansas	IDIdaho	MN.....Minnesota	NV Nevada	TX Texas
AZ..... Arizona	IL.....Illinois	MOMissouri	NY New York	UT Utah
CA..... California	INIndiana	MS.....Mississippi	OH..... Ohio	VA..... Virginia
CO Colorado	KSKansas	MTMontana	OK.....Oklahoma	VT Vermont
CT Connecticut	KYKentucky	NCNorth Carolina	OR..... Oregon	WA..... Washington
DC District of Columbia	LA Louisiana	NDNorth Dakota	PA..... Pennsylvania	WI Wisconsin
DE Delaware	MA Massachusetts	NENebraska	RI..... Rhode Island	WV..... West Virginia
FL Florida	MDMaryland	NHNew Hampshire	SC South Carolina	WY Wyoming
GA Georgia				

Eighth Grade Mathematics Performance

Figure 8-1
 Quartile groups for eighth grade mathematics performance: 2000



1st quartile (288–282)	2nd quartile (281–276)	3rd quartile (275–266)	4th quartile (263–254)	No data
Connecticut	Idaho	Arizona	Alabama	Alaska
Indiana	Illinois	Georgia	Arkansas	Colorado
Kansas	Maryland	Kentucky	California	Delaware
Maine	Michigan	Missouri	District of Columbia	Florida
Massachusetts	Nebraska	Nevada	Hawaii	Iowa
Minnesota	New York	Oklahoma	Louisiana	New Hampshire
Montana	North Carolina	Rhode Island	Mississippi	New Jersey
North Dakota	Oregon	South Carolina	New Mexico	Pennsylvania
Ohio	Virginia	Texas	Tennessee	South Dakota
Vermont	Wyoming	Utah		Washington
		West Virginia		Wisconsin

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress. See table 8-1.

Understanding mathematics is an important life skill and a prerequisite to further study in science or engineering. This indicator measures the knowledge of a state’s eighth grade public school students in mathematics.

The National Assessment of Educational Progress (NAEP) is a federally authorized ongoing assessment of student performance in various subjects on a national scale. States participate at their option; no data means the state did not participate. The mathematics assessment is based on the *NAEP Mathematics Framework*, developed through a national consensus process. Questions cover five areas: number sense, properties, and operations; measurement; geometry and spatial sense; data analysis, statistics, and probability; and algebra and functions.

The 2000 NAEP for mathematics was administered to 4th, 8th, and 12th grade students in 1990, 1992, 1996,

and 2000. The 2000 national 8th grade public school sample comprised 9,389 students from 385 public schools. Although the size of individual state samples may vary, samples included about 2,500 8th graders from 100 public schools in each state.

Student performance is described in terms of average scores on a 0–500 scale and achievement levels: basic, proficient, and advanced. The basic level (262–298) denotes partial mastery of the knowledge and skills that are fundamental for proficient work in mathematics at the eighth grade level. The proficient level (299–332) represents solid academic performance and demonstrates that the student is competent in handling challenging mathematical subject matter. The advanced level (333–500) signifies superior performance in mathematics at the eighth grade level.

Findings

- Nationwide, eighth graders in public schools showed progress throughout the decade, with a higher average score in 2000 (274) than in 1990 (263) and 1992 (267).
- In 2000, the nationwide percentage of eighth grade public school students performing at or above the proficient level—identified by the National Assessment Governing Board as the level that all students should reach—was 27 percent.
- All but five of the participating states had averages in the basic achievement level, indicating partial mastery; none reached a proficient or superior average.

Table 8-1
**Eighth grade mathematics performance, by state:
 1992, 1996, and 2000**
 (Score)

State	1992	1996	2000
National average	267	271	274
Alabama	252	257	262
Alaska	NA	278	NA
Arizona	265	268	271
Arkansas	256	262	261
California	261	263	262
Colorado	272	276	NA
Connecticut.....	274	280	282
Delaware	263	267	NA
District of Columbia	235	233	234
Florida	260	264	NA
Georgia.....	259	262	266
Hawaii.....	257	262	263
Idaho	NA	NA	278
Illinois	NA	NA	277
Indiana.....	270	276	283
Iowa.....	283	284	NA
Kansas	NA	NA	284
Kentucky	262	267	272
Louisiana	250	252	259
Maine.....	279	284	284
Maryland	265	270	276
Massachusetts.....	273	278	283
Michigan.....	267	277	278
Minnesota	282	284	288
Mississippi	246	250	254
Missouri.....	271	273	274
Montana	NA	283	287
Nebraska.....	278	283	281
Nevada	NA	NA	268
New Hampshire	NA	NA	NA
New Jersey	NA	NA	NA
New Mexico	260	262	260
New York.....	266	270	276
North Carolina	258	268	280
North Dakota.....	283	284	283
Ohio	NA	NA	283
Oklahoma.....	NA	NA	272
Oregon	NA	276	281
Pennsylvania	NA	NA	NA
Rhode Island	266	269	273
South Carolina	261	261	266
South Dakota	NA	NA	NA
Tennessee	259	263	263
Texas	265	270	275
Utah.....	274	277	275
Vermont.....	NA	279	283
Virginia.....	268	270	277
Washington	NA	276	NA
West Virginia.....	259	265	271
Wisconsin.....	278	283	NA
Wyoming.....	275	275	277
Puerto Rico	NA	NA	NA

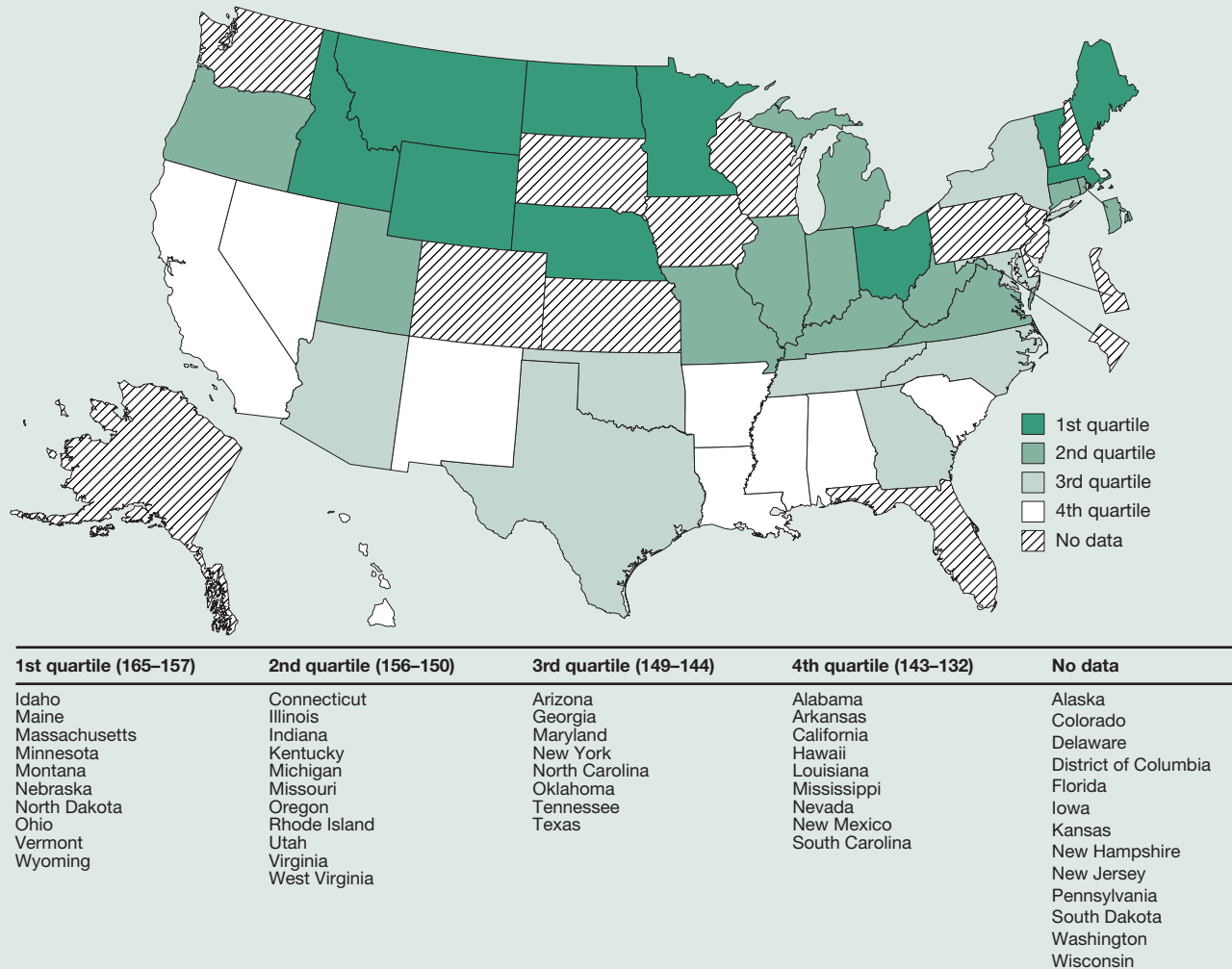
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NOTES: The national average for each year is the reported value for the nation found in the National Assessment of Educational Progress (NAEP) reports. NAEP grade 8 mathematics scores are for public schools only. In 1992, Alaska, Montana, Oregon, Vermont, and Washington did not participate in NAEP. In 1996, Alaska, Arkansas, Iowa, Maryland, Michigan, Montana, New York, South Carolina, Vermont, and Wisconsin did not satisfy one or more school participation rate guidelines for the school sample(s). In 2000, Arizona, California, Idaho, Illinois, Indiana, Kansas, Maine, Michigan, Minnesota, Montana, New York, Oregon, and Vermont did not satisfy one or more school participation rate guidelines for the school sample(s).

SOURCE: U.S. Department of Education, National Center for Education Statistics, NAEP, various years.

Eighth Grade Science Performance

Figure 8-2
Quartile groups for eighth grade science performance: 2000



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress. See table 8-2.

Understanding fundamentals of science is important in modern society and a prerequisite to further study in science or engineering. This indicator measures the knowledge of a state’s eighth grade public school students in science.

The National Assessment of Educational Progress (NAEP) is a federally authorized ongoing assessment of student achievement. States participate at their option; no data means the state did not participate. The assessment is based on the *NAEP Science Framework*, developed through a national consensus process. Questions cover three content areas—earth, physical, and life sciences—including students’ conceptual understanding, scientific investigation, and practical reasoning.

The NAEP for science was administered in 1996 and 2000 to representative samples of 4th, 8th, and 12th graders. The 2000 sample comprised 9,443 8th graders from 385 public schools. Although the size of state samples may vary, they included about 2,500 students from 100 schools in each state.

Student performance is described in terms of average scores on a 0–300 scale and achievement levels: basic, proficient, and advanced.

The basic level (143–169) denotes partial mastery of the knowledge and skills fundamental for proficient work at the eighth grade level. The proficient level (170–207) represents solid academic performance. Students reaching this level are competent

Findings

- Nationwide, eighth graders scored similarly in 1996 (148) and 2000 (149).
- In 2000, the nationwide percentage of eighth grade students performing at or above the proficient level—identified by the National Assessment Governing Board as the level that all students should reach—was 32 percent.
- All but seven of the participating states had averages in the basic achievement level, indicating partial mastery; none reached a proficient or superior average.

with challenging subject matter, including knowledge, application of such knowledge to real-world situations, and appropriate analytical skills. The advanced level (208–300) signifies superior performance.

Table 8-2
**Eighth grade science performance, by state:
 1996 and 2000**
 (Score)

State	1996	2000
National average	148	149
Alabama	139	141
Alaska	153	NA
Arizona	145	146
Arkansas	144	143
California	138	132
Colorado	155	NA
Connecticut.....	155	154
Delaware	142	NA
District of Columbia	113	NA
Florida	142	NA
Georgia.....	142	144
Hawaii.....	135	132
Idaho	NA	159
Illinois	NA	150
Indiana.....	153	156
Iowa.....	158	NA
Kansas	NA	NA
Kentucky	147	152
Louisiana	132	136
Maine.....	163	160
Maryland	145	149
Massachusetts.....	157	161
Michigan.....	153	156
Minnesota	159	160
Mississippi	133	134
Missouri.....	151	156
Montana	162	165
Nebraska.....	157	157
Nevada	NA	143
New Hampshire	NA	NA
New Jersey	NA	NA
New Mexico	141	140
New York.....	146	149
North Carolina.....	147	147
North Dakota.....	162	161
Ohio	NA	161
Oklahoma.....	NA	149
Oregon	155	154
Pennsylvania	NA	NA
Rhode Island	149	150
South Carolina	139	142
South Dakota	NA	NA
Tennessee	143	146
Texas	145	144
Utah.....	156	155
Vermont.....	157	161
Virginia.....	149	152
Washington	150	NA
West Virginia.....	147	150
Wisconsin.....	160	NA
Wyoming.....	158	158
Puerto Rico	NA	NA

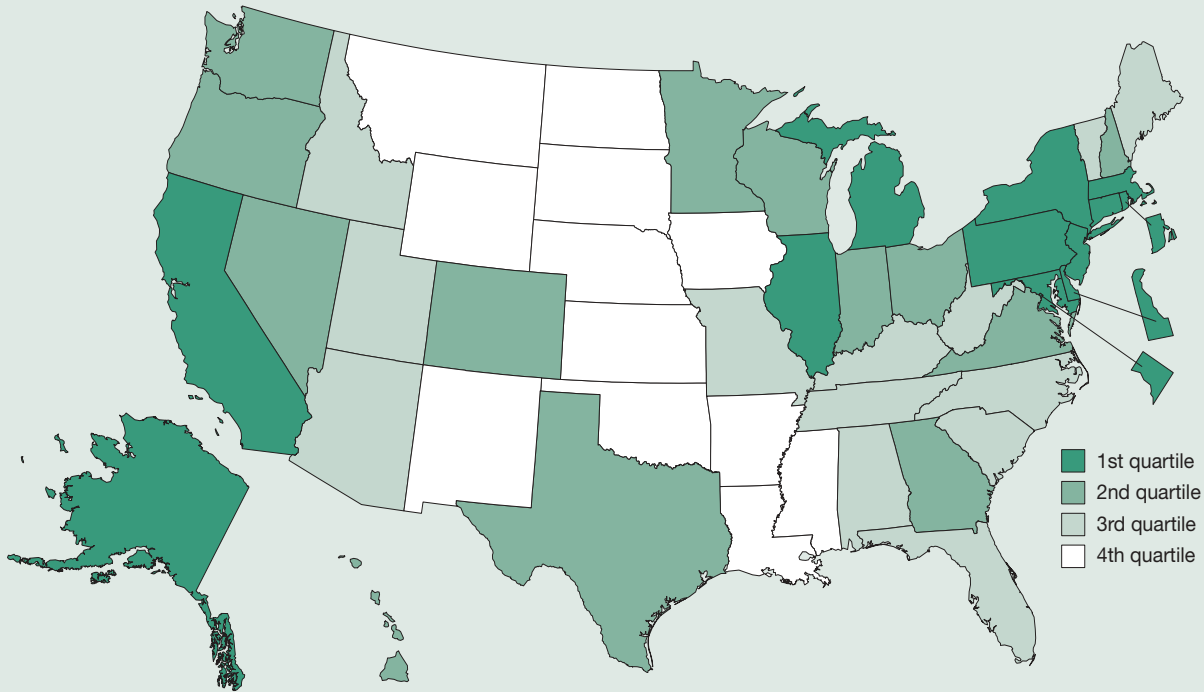
NA not available

NOTES: The national average for each year is the reported value for the nation found in the National Assessment of Educational Progress (NAEP) reports. NAEP grade 8 science scores are for public schools only. In 1996, Alaska, Arkansas, Iowa, Maryland, Michigan, Montana, New York, South Carolina, Vermont, and Wisconsin did not satisfy one or more school participation rate guidelines for the school sample(s). In 2000, Arizona, California, Idaho, Illinois, Indiana, Maine, Michigan, Minnesota, Montana, New York, Oregon, Vermont, and Wisconsin did not satisfy one or more school participation rate guidelines for the school sample(s).

SOURCE: U.S. Department of Education, National Center for Education Statistics, NAEP, various years.

Public School Teacher Salaries

Figure 8-3
Quartile groups for public school teacher salaries: 2000



1st quartile (\$51,160–42,111)	2nd quartile (\$40,809–36,379)	3rd quartile (\$36,004–32,872)	4th quartile (\$32,126–27,345)
Alaska	Colorado	Alabama	Arkansas
California	Georgia	Arizona	Iowa
Connecticut	Hawaii	Florida	Kansas
Delaware	Indiana	Idaho	Louisiana
District of Columbia	Minnesota	Kentucky	Mississippi
Illinois	Nevada	Maine	Montana
Maryland	New Hampshire	Missouri	Nebraska
Massachusetts	Ohio	North Carolina	New Mexico
Michigan	Oregon	South Carolina	North Dakota
New Jersey	Texas	Tennessee	Oklahoma
New York	Virginia	Utah	South Dakota
Pennsylvania	Washington	Vermont	Wyoming
Rhode Island	Wisconsin	West Virginia	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000. See table 8-3.

This indicator measures the income public school teachers receive from their work. Relatively low teacher salaries are said to hinder recruitment into the teaching profession.

Public school teacher salaries may reflect a range of factors, including the value placed on primary and secondary education, a state’s cost of living, the experience and educational attainment

of the teachers, and local supply and demand in the job market. The average salary is the average of the base salary of full-time public school teachers during the 1999–2000 school year. It includes recent college graduates and seasoned veterans. Educational credentials may encompass provisional certification through bachelor’s, master’s, or doctoral degrees.

Findings

- Salaries for public school teachers nationwide averaged \$39,893 in 2000 and among states ranged from a high of more than \$51,000 to a low of \$27,000.
- Seventeen states and the District of Columbia had average salaries higher than the national average, and 33 states had lower average salaries.
- The median salary was \$36,379. High salaries for public school teachers do not necessarily correspond to high average student achievement scores on the NAEP mathematics and science tests.

Table 8-3
Public school teacher salaries, by state: 2000

State	Average salary
National average	39,893
Alabama	34,818
Alaska	45,665
Arizona.....	33,924
Arkansas.....	31,300
California	45,111
Colorado.....	37,012
Connecticut.....	50,170
Delaware.....	42,732
District of Columbia	46,634
Florida.....	35,819
Georgia	38,504
Hawaii	38,217
Idaho.....	34,416
Illinois.....	42,152
Indiana	40,809
Iowa	31,953
Kansas.....	32,126
Kentucky	34,478
Louisiana	29,811
Maine.....	36,004
Maryland.....	42,111
Massachusetts	45,079
Michigan.....	47,615
Minnesota.....	40,372
Mississippi.....	30,592
Missouri	32,872
Montana	30,271
Nebraska	29,114
Nevada	38,514
New Hampshire.....	37,563
New Jersey.....	51,036
New Mexico	32,055
New York	51,160
North Carolina	33,375
North Dakota	27,345
Ohio	39,348
Oklahoma	29,017
Oregon.....	40,302
Pennsylvania	46,917
Rhode Island	46,504
South Carolina.....	34,273
South Dakota	27,488
Tennessee	33,312
Texas	36,379
Utah	34,008
Vermont	35,480
Virginia	36,888
Washington	40,200
West Virginia.....	34,260
Wisconsin.....	39,969
Wyoming	31,501
Puerto Rico.....	NA

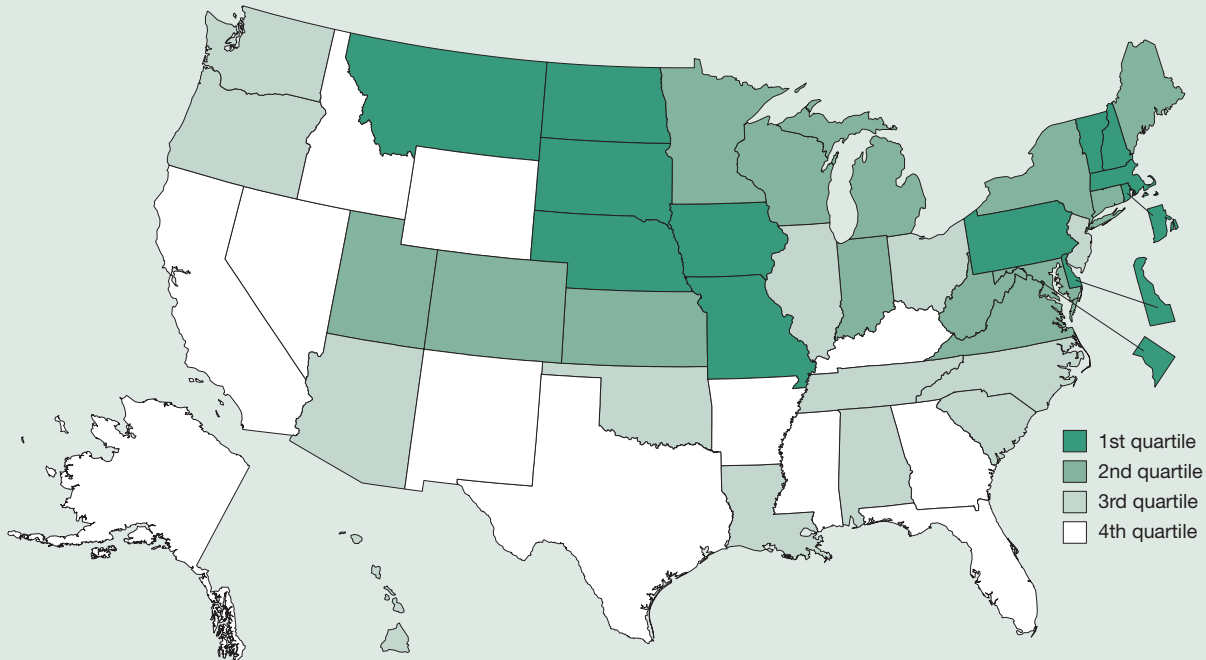
NA not available

NOTE: Public school teacher salaries are the average of the base salaries of full-time public school teachers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

Bachelor's Degrees Conferred per 1,000 18–24-Year-Olds

Figure 8-4
Quartile groups for bachelor's degrees conferred per 1,000 18–24-year-olds: 2000



1st quartile (104.5–55.9)	2nd quartile (55.6–48.4)	3rd quartile (48.4–39.8)	4th quartile (38.9–22.6)
Delaware	Colorado	Alabama	Alaska
District of Columbia	Connecticut	Arizona	Arkansas
Iowa	Indiana	Hawaii	California
Massachusetts	Kansas	Illinois	Florida
Missouri	Maine	Louisiana	Georgia
Montana	Maryland	New Jersey	Idaho
Nebraska	Michigan	North Carolina	Kentucky
New Hampshire	Minnesota	Ohio	Mississippi
North Dakota	New York	Oklahoma	Nevada
Pennsylvania	Utah	Oregon	New Mexico
Rhode Island	Virginia	South Carolina	Texas
South Dakota	West Virginia	Tennessee	Wyoming
Vermont	Wisconsin	Washington	

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System; and U.S. Bureau of the Census, Population Division. See table 8-4.

Earning a bachelor's degree gives people a greater opportunity to work in higher paying jobs than is generally available to people with less education; it also prepares them for advanced education. The ratio of bachelor's degrees awarded to a state's 18–24-year-old population is a broad measure of a state's relative success in producing degrees at this level. The 18–24-year-old cohort was chosen to approximate

the age range of most people pursuing an undergraduate degree.

A high value of this indicator may suggest the successful provision of educational opportunity at this level. The value may also be high when a higher education system draws many out-of-state students, which may particularly affect the results for some sparsely populated states and the District of Columbia.

Findings

- In 2000, 1.24 million bachelor's degrees were conferred in all fields, up from 1.05 million in 1990.
- This increase across the United States in 2000 translates to about 46 bachelor's degrees per 1,000 18–24-year-olds, ranging from about 23 to 85 across states; the District of Columbia exceeded 104 (an outlier reflecting special characteristics).
- Over the decade, the number of bachelor's degrees awarded in the United States increased relative to the 18–24-year-old population, rising from 39 in 1990 to 46 by mid-decade, similar to the 2000 level.
- The pattern for states in the top two quartiles is similar to those for mathematics and science performance of eighth graders.

Table 8-4
Bachelor's degrees conferred per 1,000 18–24-year-olds, by state: 1990, 1995, and 2000

State	Bachelor's degrees			18–24-year-old population			Bachelor's degrees per 1,000 18–24-year-olds		
	1990	1995	2000	1990	1995	2000	1990	1995	2000
All states.....	1,049,656	1,160,126	1,236,378	26,737,766	25,112,313	27,143,454	39.3	46.2	45.5
Alabama.....	17,059	19,924	21,185	443,335	444,704	439,612	38.5	44.8	48.2
Alaska.....	1,043	1,526	1,364	55,847	62,426	57,292	18.7	24.4	23.8
Arizona.....	14,172	18,533	24,867	392,680	413,693	514,101	36.1	44.8	48.4
Arkansas.....	7,475	8,623	9,405	237,056	248,435	261,738	31.5	34.7	35.9
California.....	98,069	108,215	116,648	3,412,257	3,013,123	3,366,030	28.7	35.9	34.7
Colorado.....	17,344	20,226	21,771	335,525	351,400	430,111	51.7	57.6	50.6
Connecticut.....	14,333	14,158	14,546	345,433	270,474	271,585	41.5	52.3	53.6
Delaware.....	3,462	4,421	4,616	76,233	67,051	75,328	45.4	65.9	61.3
District of Columbia.....	7,449	7,661	7,589	82,558	51,875	72,637	90.2	147.7	104.5
Florida.....	35,493	44,916	50,476	1,215,657	1,170,757	1,330,602	29.2	38.4	37.9
Georgia.....	21,402	26,312	28,947	738,584	730,927	837,732	29.0	36.0	34.6
Hawaii.....	3,720	4,500	4,993	121,185	115,821	114,893	30.7	38.9	43.5
Idaho.....	3,169	4,235	4,711	98,247	126,435	138,829	32.3	33.5	33.9
Illinois.....	49,757	52,436	55,330	1,212,950	1,127,699	1,210,898	41.0	46.5	45.7
Indiana.....	27,625	30,253	31,936	604,882	582,508	614,721	45.7	51.9	52.0
Iowa.....	16,129	17,421	18,675	283,713	273,088	298,008	56.8	63.8	62.7
Kansas.....	12,521	14,835	14,681	254,493	251,111	275,592	49.2	59.1	53.3
Kentucky.....	12,225	14,570	15,643	399,989	401,248	401,858	30.6	36.3	38.9
Louisiana.....	15,905	17,920	19,693	464,511	460,667	473,801	34.2	38.9	41.6
Maine.....	4,944	5,893	5,672	123,772	112,864	103,903	39.9	52.2	54.6
Maryland.....	19,502	20,824	21,887	505,373	432,516	450,922	38.6	48.1	48.5
Massachusetts.....	43,559	40,279	42,308	709,099	538,602	579,328	61.4	74.8	73.0
Michigan.....	42,428	44,317	45,407	1,004,527	935,335	932,137	42.2	47.4	48.7
Minnesota.....	22,851	23,872	23,129	442,809	417,482	470,434	51.6	57.2	49.2
Mississippi.....	8,808	10,335	10,982	293,346	303,426	310,974	30.0	34.1	35.3
Missouri.....	24,612	27,918	29,964	517,191	499,397	535,978	47.6	55.9	55.9
Montana.....	3,862	4,354	5,071	70,011	83,675	85,757	55.2	52.0	59.1
Nebraska.....	8,677	10,105	10,755	155,887	160,166	174,425	55.7	63.1	61.7
Nevada.....	2,235	3,365	4,070	118,945	128,251	179,708	18.8	26.2	22.6
New Hampshire.....	6,745	7,395	7,776	117,602	96,548	103,369	57.4	76.6	75.2
New Jersey.....	22,859	24,627	26,939	779,184	678,491	676,628	29.3	36.3	39.8
New Mexico.....	5,010	6,032	6,215	151,824	167,305	177,576	33.0	36.1	35.0
New York.....	90,195	94,762	98,220	1,953,424	1,649,416	1,765,453	46.2	57.5	55.6
North Carolina.....	27,288	32,321	35,257	781,053	716,816	806,821	34.9	45.1	43.7
North Dakota.....	4,202	4,440	4,877	67,853	66,177	73,118	61.9	67.1	66.7
Ohio.....	47,144	49,755	49,973	1,136,418	1,070,668	1,056,544	41.5	46.5	47.3
Oklahoma.....	13,601	15,307	15,573	321,389	328,996	357,085	42.3	46.5	43.6
Oregon.....	12,586	12,917	14,074	267,528	282,990	327,884	47.0	45.6	42.9
Pennsylvania.....	60,572	63,072	66,344	1,226,775	1,074,942	1,094,449	49.4	58.7	60.6
Rhode Island.....	8,789	9,094	8,594	120,358	90,614	106,607	73.0	100.4	80.6
South Carolina.....	13,215	15,060	16,523	406,526	389,480	407,851	32.5	38.7	40.5
South Dakota.....	3,760	4,412	4,760	68,113	72,599	77,634	55.2	60.8	61.3
Tennessee.....	17,577	20,463	22,815	527,655	516,027	548,856	33.3	39.7	41.6
Texas.....	60,472	70,048	75,830	1,890,844	1,943,360	2,198,881	32.0	36.0	34.5
Utah.....	10,907	14,262	16,797	199,986	253,174	317,431	54.5	56.3	52.9
Vermont.....	4,517	4,591	4,810	63,166	54,240	56,586	71.5	84.6	85.0
Virginia.....	27,119	30,472	32,905	719,731	659,229	679,398	37.7	46.2	48.4
Washington.....	18,320	21,773	23,920	488,539	500,401	559,361	37.5	43.5	42.8
West Virginia.....	7,414	8,656	8,545	179,991	189,426	172,431	41.2	45.7	49.6
Wisconsin.....	25,888	26,943	27,513	512,326	485,889	520,629	50.5	55.5	52.8
Wyoming.....	1,646	1,777	1,797	41,386	50,369	49,928	39.8	35.3	36.0
Puerto Rico.....	12,173	13,820	16,164	NA	NA	428,894	NA	NA	37.7

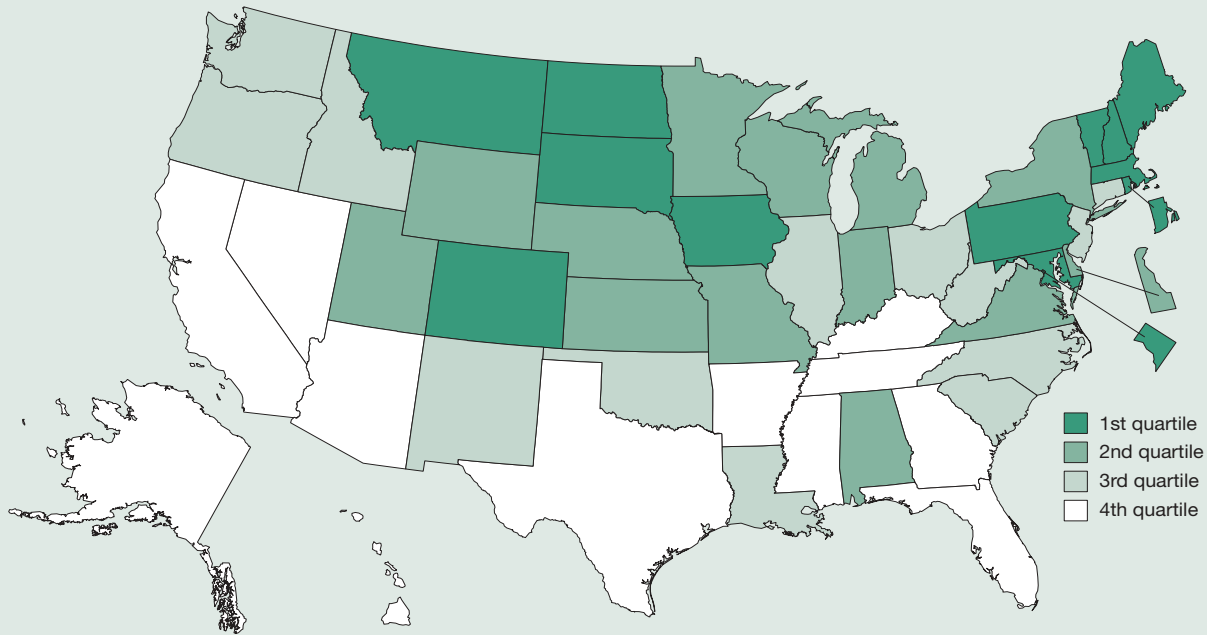
NA not available

NOTE: The state total for each year is the sum of the 50 states and the District of Columbia.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, various years; and U.S. Bureau of the Census, Population Division.

NS&E Bachelor's Degrees Conferred per 1,000 18–24-Year-Olds

Figure 8-5
 Quartile groups for NS&E bachelor's degrees conferred per 1,000 18–24-year-olds: 2000



1st quartile (18.67–9.73)	2nd quartile (9.32–8.05)	3rd quartile (7.76–6.73)	4th quartile (6.53–3.05)
Colorado	Alabama	Connecticut	Alaska
District of Columbia	Delaware	Idaho	Arizona
Iowa	Indiana	Illinois	Arkansas
Maine	Kansas	Louisiana	California
Maryland	Michigan	New Jersey	Florida
Massachusetts	Minnesota	New Mexico	Georgia
Montana	Missouri	North Carolina	Hawaii
New Hampshire	Nebraska	Ohio	Kentucky
North Dakota	New York	Oklahoma	Mississippi
Pennsylvania	Utah	Oregon	Nevada
Rhode Island	Virginia	South Carolina	Tennessee
South Dakota	Wisconsin	Washington	Texas
Vermont	Wyoming	West Virginia	

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System; and U.S. Bureau of the Census, Population Division. See table 8-5.

Natural sciences and engineering (NS&E) include physical, earth, ocean, atmospheric, biological, agricultural and computer sciences; mathematics; and engineering. The ratio of new NS&E bachelor's degrees to the 18–24-year-old population indicates the degree to which a state prepares young people to enter the types of technology-intensive occupations that are fundamental to a knowledge-based, technology-driven economy. The 18–24-year-old cohort was chosen to approximate the age range of most people pursuing an undergraduate degree.

A high value for this indicator may suggest relative success in providing a technical undergraduate education. It may also indicate the existence of a higher education system that draws many out-of-state students into NS&E fields, which may particularly affect the results for some sparsely populated states and the District of Columbia.

Findings

- Over the past decade, the number of NS&E bachelor's degrees increased by roughly 25 percent. Nearly 170,000 degrees were awarded in 1990, and the number of degrees exceeded 200,000 in 2000. During this period, the number of 18–24-year-olds remained relatively constant.
- Reflecting the slower population cohort growth, the national average for the number of NS&E bachelor's degrees awarded per 1,000 18–24-year-olds increased from 6.3 in 1990 to 7.6 in 2000; some states, including some larger ones, had pronounced increases in this ratio.
- State values ranged from 3.1 to 14.8 and state ratings generally were in the same quartiles on this measure as on the number of bachelor's degrees conferred per 1,000 18–24-year-olds.
- In 2000, NS&E bachelor's degrees accounted for 17 percent of all bachelor's degrees awarded, up slightly from 16 percent in 1990.

Table 8-5
NS&E bachelor's degrees conferred per 1,000 18–24-year-olds, by state: 1990, 1995, and 2000

State	NS&E bachelor's degrees			18–24-year-old population			NS&E bachelor's degrees per 1,000 18–24-year-olds		
	1990	1995	2000	1990	1995	2000	1990	1995	2000
State total.....	167,475	190,344	207,338	26,737,766	25,112,313	27,143,454	6.26	7.58	7.64
Alabama.....	3,022	3,466	3,530	443,335	444,704	439,612	6.82	7.79	8.03
Alaska.....	200	220	240	55,847	62,426	57,292	3.58	3.52	4.19
Arizona.....	2,006	2,922	2,836	392,680	413,693	514,101	5.11	7.06	5.52
Arkansas.....	1,026	1,273	1,440	237,056	248,435	261,738	4.33	5.12	5.50
California.....	18,354	20,194	21,970	3,412,257	3,013,123	3,366,030	5.38	6.70	6.53
Colorado.....	3,548	4,492	4,709	335,525	351,400	430,111	10.57	12.78	10.95
Connecticut.....	1,950	2,143	1,958	345,433	270,474	271,585	5.65	7.92	7.21
Delaware.....	531	640	687	76,233	67,051	75,328	6.97	9.54	9.12
District of Columbia.....	1,032	1,187	1,356	82,558	51,875	72,637	12.50	22.88	18.67
Florida.....	4,793	6,077	7,333	1,215,657	1,170,757	1,330,602	3.94	5.19	5.51
Georgia.....	3,275	4,171	5,117	738,584	730,927	837,732	4.43	5.71	6.11
Hawaii.....	546	562	719	121,185	115,821	114,893	4.51	4.85	6.26
Idaho.....	554	793	1,013	98,247	126,435	138,829	5.64	6.27	7.30
Illinois.....	7,986	7,916	8,971	1,212,950	1,127,699	1,210,898	6.58	7.02	7.41
Indiana.....	4,623	4,887	5,113	604,882	582,508	614,721	7.64	8.39	8.32
Iowa.....	2,544	2,839	3,135	283,713	273,088	298,008	8.97	10.40	10.52
Kansas.....	1,997	2,304	2,471	254,493	251,111	275,592	7.85	9.18	8.97
Kentucky.....	1,685	2,044	2,266	399,989	401,248	401,858	4.21	5.09	5.64
Louisiana.....	2,258	2,904	3,395	464,511	460,667	473,801	4.86	6.30	7.17
Maine.....	726	910	1,091	123,772	112,864	103,903	5.87	8.06	10.50
Maryland.....	3,483	3,988	4,386	505,373	432,516	450,922	6.89	9.22	9.73
Massachusetts.....	6,824	6,698	7,328	709,099	538,602	579,328	9.62	12.44	12.65
Michigan.....	7,640	8,074	8,305	1,004,527	935,335	932,137	7.61	8.63	8.91
Minnesota.....	3,141	3,723	4,044	442,809	417,482	470,434	7.09	8.92	8.60
Mississippi.....	1,289	1,718	1,733	293,346	303,426	310,974	4.39	5.66	5.57
Missouri.....	3,656	4,176	4,818	517,191	499,397	535,978	7.07	8.36	8.99
Montana.....	860	920	1,173	70,011	83,675	85,757	12.28	10.99	13.68
Nebraska.....	1,026	1,312	1,581	155,887	160,166	174,425	6.58	8.19	9.06
Nevada.....	295	434	548	118,945	128,251	179,708	2.48	3.38	3.05
New Hampshire.....	1,003	1,229	1,281	117,602	96,548	103,369	8.53	12.73	12.39
New Jersey.....	3,772	4,267	5,249	779,184	678,491	676,628	4.84	6.29	7.76
New Mexico.....	990	1,134	1,229	151,824	167,305	177,576	6.52	6.78	6.92
New York.....	13,723	13,762	14,514	1,953,424	1,649,416	1,765,453	7.03	8.34	8.22
North Carolina.....	4,463	6,145	6,172	781,053	716,816	806,821	5.71	8.57	7.65
North Dakota.....	788	817	893	67,853	66,177	73,118	11.61	12.35	12.21
Ohio.....	6,978	7,480	7,828	1,136,418	1,070,668	1,056,544	6.14	6.99	7.41
Oklahoma.....	2,012	2,215	2,491	321,389	328,996	357,085	6.26	6.73	6.98
Oregon.....	1,668	1,817	2,437	267,528	282,990	327,884	6.23	6.42	7.43
Pennsylvania.....	10,627	11,221	11,685	1,226,775	1,074,942	1,094,449	8.66	10.44	10.68
Rhode Island.....	870	1,163	1,236	120,358	90,614	106,607	7.23	12.83	11.59
South Carolina.....	1,933	2,499	2,744	406,526	389,480	407,851	4.75	6.42	6.73
South Dakota.....	755	942	1,039	68,113	72,599	77,634	11.08	12.98	13.38
Tennessee.....	2,889	3,365	3,455	527,655	516,027	548,856	5.48	6.52	6.29
Texas.....	8,788	11,118	11,868	1,890,844	1,943,360	2,198,881	4.65	5.72	5.40
Utah.....	1,604	2,356	2,817	199,986	253,174	317,431	8.02	9.31	8.87
Vermont.....	677	723	840	63,166	54,240	56,586	10.72	13.33	14.84
Virginia.....	4,230	5,536	5,929	719,731	659,229	679,398	5.88	8.40	8.73
Washington.....	2,784	3,426	3,850	488,539	500,401	559,361	5.70	6.85	6.88
West Virginia.....	974	1,208	1,208	179,991	189,426	172,431	5.41	6.38	7.01
Wisconsin.....	4,776	4,520	4,850	512,326	485,889	520,629	9.32	9.30	9.32
Wyoming.....	301	414	457	41,386	50,369	49,928	7.27	8.22	9.15
Puerto Rico.....	2,074	2,468	3,033	NA	NA	428,894	NA	NA	8.41

NA not available

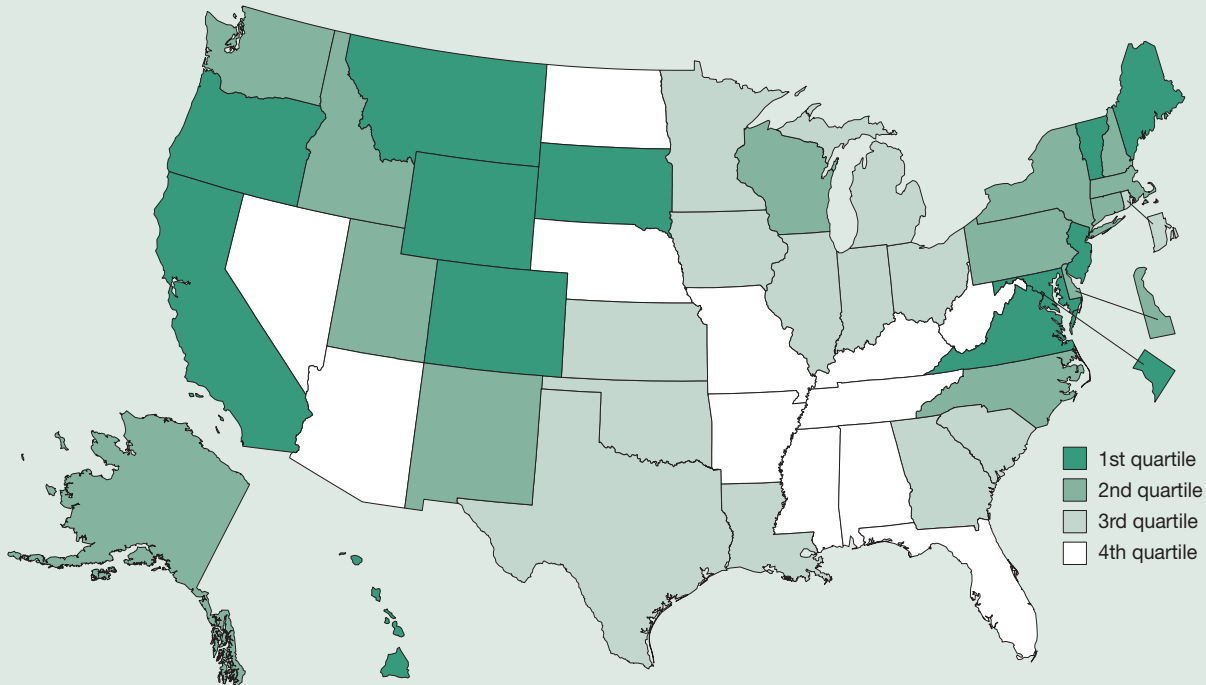
NS&E natural sciences and engineering

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. NS&E degrees include degrees in physical, computer, agricultural, biological, earth, atmospheric, and ocean sciences; mathematics; and engineering.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, various years; and U.S. Bureau of the Census, Population Division.

S&E Degrees as Share of Higher Education Degrees Conferred

Figure 8-6
Quartile groups for S&E degrees as share of higher education degrees conferred: 2000



1st quartile (40.7–32.7 percent)	2nd quartile (32.6–28.8 percent)	3rd quartile (28.6–26.6 percent)	4th quartile (26.2–17.1 percent)
California	Alaska	Georgia	Alabama
Colorado	Connecticut	Illinois	Arizona
District of Columbia	Delaware	Indiana	Arkansas
Hawaii	Idaho	Iowa	Florida
Maine	Massachusetts	Kansas	Kentucky
Maryland	New Hampshire	Louisiana	Mississippi
Montana	New Mexico	Michigan	Missouri
New Jersey	New York	Minnesota	Nebraska
Oregon	North Carolina	Ohio	Nevada
South Dakota	Pennsylvania	Oklahoma	North Dakota
Vermont	Utah	Rhode Island	Tennessee
Virginia	Washington	South Carolina	West Virginia
Wyoming	Wisconsin	Texas	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System. See table 8-6.

This indicator is a measure of the extent that a state’s higher education programs are concentrated in science and engineering areas. The indicator is expressed as the percentage of higher education degrees that were conferred in S&E fields. High values for this indicator are from states that emphasize S&E fields in their higher education systems.

S&E includes physical, life, earth, ocean, atmospheric, computer, and

social sciences; mathematics; engineering; and psychology. For both S&E degrees and higher degrees conferred, bachelor’s, master’s, and doctoral degrees are included; associate’s degrees are excluded. The geographic location refers to the location of the degree-granting institution. The year is the latter date of the academic year. For instance, data for 2000 are degrees conferred during the 1999–2000 academic year.

Findings

- In 2000, nearly 515,000 S&E bachelor’s, master’s, and doctoral degrees were conferred nationwide, 20 percent more than in 1990.
- Throughout the period, S&E degrees represented about 30 percent of higher education degrees conferred nationwide.
- States ranged from 17 to nearly 41 percent on this measure in 2000.

Table 8-6
S&E degrees as share of higher education degrees conferred, by state: 1990, 1995, and 2000

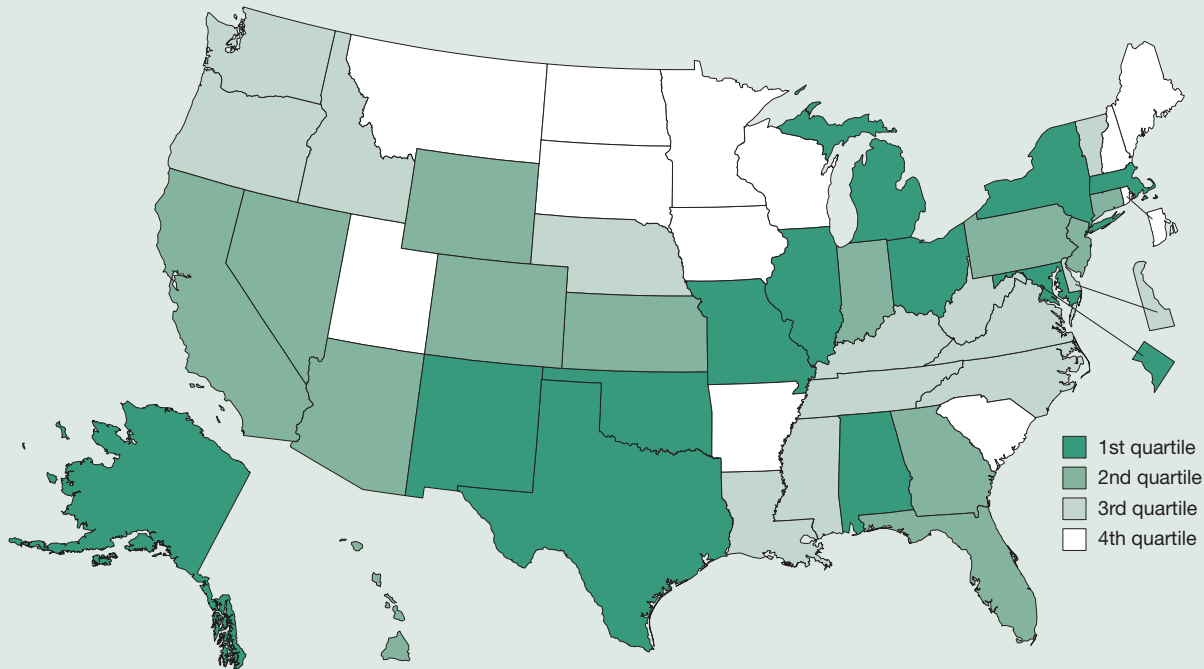
State	S&E degrees			All higher education degrees			S&E/higher education degrees conferred (percent)		
	1990	1995	2000	1990	1995	2000	1990	1995	2000
All states.....	425,432	494,303	514,578	1,411,713	1,602,322	1,734,573	30.1	30.8	29.7
Alabama.....	5,468	6,692	7,486	21,923	26,345	29,740	24.9	25.4	25.2
Alaska.....	448	613	578	1,375	2,008	1,901	32.6	30.5	30.4
Arizona.....	5,022	6,818	6,691	19,887	27,051	39,047	25.3	25.2	17.1
Arkansas.....	1,941	2,554	2,828	9,318	10,835	11,936	20.8	23.6	23.7
California.....	51,407	57,575	61,388	137,935	151,478	163,630	37.3	38.0	37.5
Colorado.....	8,619	11,189	11,683	23,161	27,813	30,341	37.2	40.2	38.5
Connecticut.....	6,419	7,150	7,042	21,190	21,284	22,376	30.3	33.6	31.5
Delaware.....	1,470	1,856	1,931	4,367	5,670	6,238	33.7	32.7	31.0
District of Columbia.....	5,279	6,311	6,355	13,124	15,107	15,625	40.2	41.8	40.7
Florida.....	12,092	16,321	18,085	47,521	61,280	69,865	25.4	26.6	25.9
Georgia.....	7,858	9,862	11,288	28,629	35,887	39,763	27.4	27.5	28.4
Hawaii.....	1,559	1,876	2,203	4,841	6,174	6,687	32.2	30.4	32.9
Idaho.....	1,144	1,652	1,823	4,049	5,392	5,943	28.3	30.6	30.7
Illinois.....	20,570	21,309	22,749	71,412	78,983	85,255	28.8	27.0	26.7
Indiana.....	10,524	11,493	11,404	36,087	39,002	41,586	29.2	29.5	27.4
Iowa.....	5,385	6,391	6,611	19,739	21,585	23,084	27.3	29.6	28.6
Kansas.....	4,417	5,299	5,457	16,184	19,808	20,132	27.3	26.8	27.1
Kentucky.....	3,816	4,917	5,091	16,226	19,186	20,865	23.5	25.6	24.4
Louisiana.....	4,972	6,618	6,998	20,303	23,765	26,040	24.5	27.8	26.9
Maine.....	1,781	2,152	2,302	5,709	6,890	6,916	31.2	31.2	33.3
Maryland.....	9,609	11,001	12,201	26,795	30,735	33,531	35.9	35.8	36.4
Massachusetts.....	21,353	21,129	22,659	63,508	63,838	69,449	33.6	33.1	32.6
Michigan.....	16,889	18,447	18,420	57,038	61,325	66,966	29.6	30.1	27.5
Minnesota.....	7,878	9,287	8,951	27,967	30,521	31,648	28.2	30.4	28.3
Mississippi.....	2,589	3,599	3,397	11,471	13,355	14,602	22.6	26.9	23.3
Missouri.....	8,013	10,251	11,013	33,865	38,936	43,600	23.7	26.3	25.3
Montana.....	1,433	1,720	2,102	4,642	5,277	6,087	30.9	32.6	34.5
Nebraska.....	2,378	2,895	3,304	10,620	12,612	14,016	22.4	23.0	23.6
Nevada.....	672	1,134	1,365	2,816	4,337	5,345	23.9	26.1	25.5
New Hampshire.....	2,603	2,939	3,206	8,498	9,435	10,048	30.6	31.1	31.9
New Jersey.....	11,438	12,214	13,940	30,960	33,941	37,278	36.9	36.0	37.4
New Mexico.....	2,306	2,761	2,622	7,071	8,695	8,745	32.6	31.8	30.0
New York.....	40,748	43,600	42,967	131,126	143,457	149,317	31.1	30.4	28.8
North Carolina.....	10,991	14,072	14,651	34,164	40,773	46,029	32.2	34.5	31.8
North Dakota.....	1,374	1,440	1,519	4,893	5,152	5,798	28.1	28.0	26.2
Ohio.....	16,891	19,331	18,511	62,877	68,613	69,677	26.9	28.2	26.6
Oklahoma.....	4,412	5,306	5,982	17,952	20,649	21,353	24.6	25.7	28.0
Oregon.....	4,873	6,043	6,575	16,314	17,324	19,192	29.9	34.9	34.3
Pennsylvania.....	23,581	26,063	26,577	77,429	85,133	90,586	30.5	30.6	29.3
Rhode Island.....	2,744	3,185	3,012	10,774	11,430	10,696	25.5	27.9	28.2
South Carolina.....	4,489	5,816	6,036	17,385	19,976	21,649	25.8	29.1	27.9
South Dakota.....	1,407	1,930	1,871	4,573	5,482	5,722	30.8	35.2	32.7
Tennessee.....	6,234	7,729	8,029	23,025	27,305	31,284	27.1	28.3	25.7
Texas.....	21,402	27,173	27,962	80,787	95,515	103,248	26.5	28.4	27.1
Utah.....	4,716	5,880	6,277	13,747	17,524	20,194	34.3	33.6	31.1
Vermont.....	2,068	2,110	2,230	5,578	5,736	6,328	37.1	36.8	35.2
Virginia.....	12,033	15,434	15,662	35,117	42,026	44,808	34.3	36.7	35.0
Washington.....	7,806	9,278	9,627	24,123	30,145	31,740	32.4	30.8	30.3
West Virginia.....	1,926	2,621	2,750	9,282	11,083	11,144	20.7	23.6	24.7
Wisconsin.....	9,755	10,336	10,257	32,271	34,213	35,276	30.2	30.2	29.1
Wyoming.....	630	931	910	2,065	2,236	2,247	30.5	41.6	40.5
Puerto Rico.....	3,386	3,972	4,966	13,291	15,456	18,919	25.5	25.7	26.2

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. S&E degrees conferred include bachelor's, master's, and doctoral degrees. S&E degrees include degrees in physical, computer, agricultural, biological, earth, atmospheric, ocean, and social sciences; psychology; mathematics; and engineering. All degrees conferred include bachelor's, master's, and doctoral degrees.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, various years.

Advanced S&E Degrees as Share of S&E Degrees Conferred

Figure 8-7
Quartile groups for advanced S&E degrees as share of S&E degrees conferred, by state: 2000



1st quartile (46.8–25.0 percent)	2nd quartile (25.0–20.5 percent)	3rd quartile (20.5–17.9 percent)	4th quartile (17.5–8.0 percent)
Alabama	Arizona	Delaware	Arkansas
Alaska	California	Idaho	Iowa
District of Columbia	Colorado	Kentucky	Maine
Illinois	Connecticut	Louisiana	Minnesota
Maryland	Florida	Mississippi	Montana
Massachusetts	Georgia	Nebraska	New Hampshire
Michigan	Hawaii	North Carolina	North Dakota
Missouri	Indiana	Oregon	Rhode Island
New Mexico	Kansas	Tennessee	South Carolina
New York	Nevada	Vermont	South Dakota
Ohio	New Jersey	Virginia	Utah
Oklahoma	Pennsylvania	Washington	Wisconsin
Texas	Wyoming	West Virginia	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System. See table 8-7.

This indicator shows the extent to which a state’s higher education programs in science and engineering are concentrated at the graduate level. High values for this indicator are from states that emphasize graduate-level S&E training.

S&E includes physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. Advanced S&E degrees include master’s and doctoral degrees. “All degrees” includes bachelor’s, master’s, and doctoral levels. Associate’s degrees are excluded from this indicator.

Findings

- In 2000, about 120,000 advanced S&E degrees were awarded, approximately 20 percent more than in 1990.
- Total S&E degrees rose at a comparable rate, leaving the national percentage of advanced S&E degrees stable at about 23 percent of S&E degrees conferred nationwide.
- The indicator underwent considerable change for some states, shifting in both directions. States ranged from 8 to 33 percent on this indicator in 2000.
- The District of Columbia was an outlier at 47 percent.
- States that emphasize advanced S&E training are not necessarily the same as those that emphasize bachelor’s-level S&E education; only half the states in the top two quartiles on one indicator appear in the top two on the other.

Table 8-7
Advanced S&E degrees as share of S&E degrees conferred, by state: 1990, 1995, and 2000

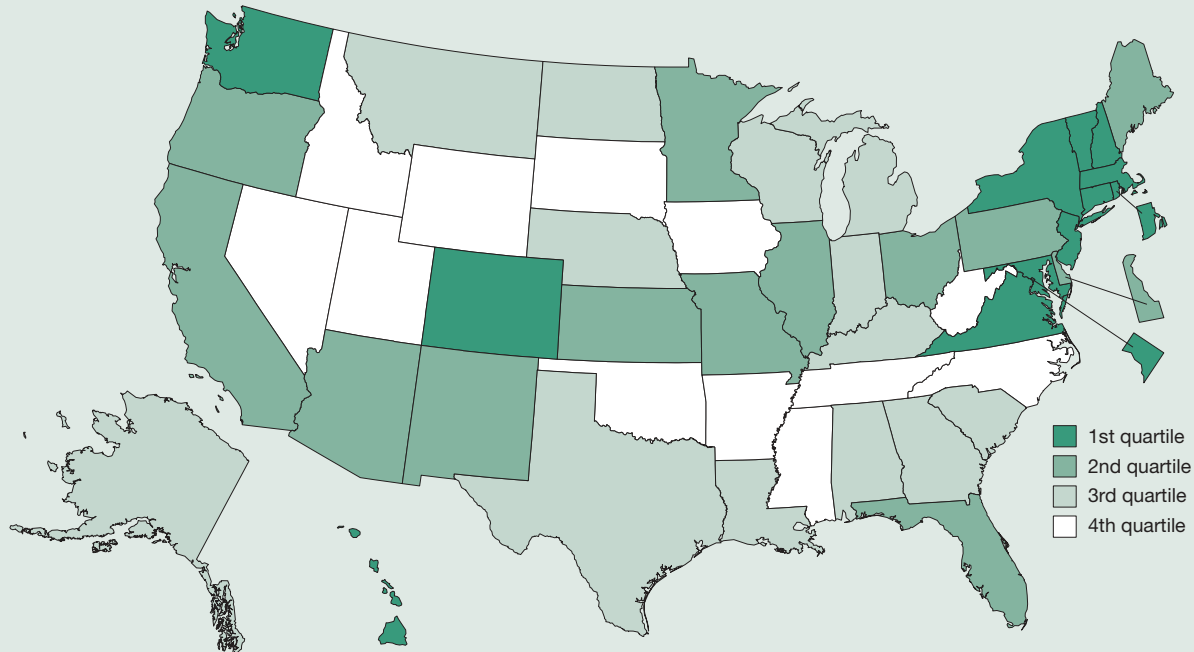
State	Advanced S&E degrees			All S&E degrees			Advanced/all S&E degrees conferred (percent)		
	1990	1995	2000	1990	1995	2000	1990	1995	2000
All states.....	99,457	119,778	120,277	425,432	494,303	514,578	23.4	24.2	23.4
Alabama.....	1,143	1,463	1,937	5,468	6,692	7,486	20.9	21.9	25.9
Alaska.....	130	215	185	448	613	578	29.0	35.1	32.0
Arizona.....	1,310	1,816	1,674	5,022	6,818	6,691	26.1	26.6	25.0
Arkansas.....	325	408	436	1,941	2,554	2,828	16.7	16.0	15.4
California.....	13,267	14,815	15,059	51,407	57,575	61,388	25.8	25.7	24.5
Colorado.....	1,993	2,911	2,894	8,619	11,189	11,683	23.1	26.0	24.8
Connecticut.....	1,658	1,765	1,748	6,419	7,150	7,042	25.8	24.7	24.8
Delaware.....	270	349	394	1,470	1,856	1,931	18.4	18.7	20.4
District of Columbia.....	2,059	2,910	2,972	5,279	6,311	6,355	39.0	46.1	46.8
Florida.....	2,764	3,940	4,012	12,092	16,321	18,085	22.9	24.1	22.2
Georgia.....	1,718	2,270	2,371	7,858	9,862	11,288	21.9	23.0	21.0
Hawaii.....	330	454	543	1,559	1,876	2,203	21.2	24.2	24.6
Idaho.....	303	418	331	1,144	1,652	1,823	26.5	25.3	18.2
Illinois.....	5,368	6,161	6,777	20,570	21,309	22,749	26.1	28.9	29.8
Indiana.....	2,178	2,551	2,483	10,524	11,493	11,404	20.7	22.2	21.8
Iowa.....	1,064	1,200	1,055	5,385	6,391	6,611	19.8	18.8	16.0
Kansas.....	1,000	1,191	1,220	4,417	5,299	5,457	22.6	22.5	22.4
Kentucky.....	810	940	938	3,816	4,917	5,091	21.2	19.1	18.4
Louisiana.....	1,047	1,526	1,430	4,972	6,618	6,998	21.1	23.1	20.4
Maine.....	175	226	185	1,781	2,152	2,302	9.8	10.5	8.0
Maryland.....	2,570	3,196	3,639	9,609	11,001	12,201	26.7	29.1	29.8
Massachusetts.....	5,787	6,139	6,597	21,353	21,129	22,659	27.1	29.1	29.1
Michigan.....	3,616	4,567	4,788	16,889	18,447	18,420	21.4	24.8	26.0
Minnesota.....	1,282	1,576	1,540	7,878	9,287	8,951	16.3	17.0	17.2
Mississippi.....	605	782	628	2,589	3,599	3,397	23.4	21.7	18.5
Missouri.....	2,086	2,700	2,793	8,013	10,251	11,013	26.0	26.3	25.4
Montana.....	251	346	368	1,433	1,720	2,102	17.5	20.1	17.5
Nebraska.....	512	586	647	2,378	2,895	3,304	21.5	20.2	19.6
Nevada.....	180	288	315	672	1,134	1,365	26.8	25.4	23.1
New Hampshire.....	343	424	418	2,603	2,939	3,206	13.2	14.4	13.0
New Jersey.....	3,038	3,040	3,118	11,438	12,214	13,940	26.6	24.9	22.4
New Mexico.....	694	898	697	2,306	2,761	2,622	30.1	32.5	26.6
New York.....	10,796	11,606	10,752	40,748	43,600	42,967	26.5	26.6	25.0
North Carolina.....	1,782	2,351	2,630	10,991	14,072	14,651	16.2	16.7	18.0
North Dakota.....	238	222	190	1,374	1,440	1,519	17.3	15.4	12.5
Ohio.....	4,456	5,155	4,635	16,891	19,331	18,511	26.4	26.7	25.0
Oklahoma.....	1,139	1,542	1,981	4,412	5,306	5,982	25.8	29.1	33.1
Oregon.....	1,034	1,348	1,227	4,873	6,043	6,575	21.2	22.3	18.7
Pennsylvania.....	4,499	5,660	5,448	23,581	26,063	26,577	19.1	21.7	20.5
Rhode Island.....	599	663	509	2,744	3,185	3,012	21.8	20.8	16.9
South Carolina.....	723	1,072	980	4,489	5,816	6,036	16.1	18.4	16.2
South Dakota.....	234	370	307	1,407	1,930	1,871	16.6	19.2	16.4
Tennessee.....	1,192	1,427	1,497	6,234	7,729	8,029	19.1	18.5	18.6
Texas.....	5,236	7,138	7,131	21,402	27,173	27,962	24.5	26.3	25.5
Utah.....	962	1,048	1,032	4,716	5,880	6,277	20.4	17.8	16.4
Vermont.....	312	306	409	2,068	2,110	2,230	15.1	14.5	18.3
Virginia.....	2,396	3,275	3,208	12,033	15,434	15,662	19.9	21.2	20.5
Washington.....	1,797	1,923	1,722	7,806	9,278	9,627	23.0	20.7	17.9
West Virginia.....	317	437	546	1,926	2,621	2,750	16.5	16.7	19.9
Wisconsin.....	1,679	1,874	1,656	9,755	10,336	10,257	17.2	18.1	16.1
Wyoming.....	190	290	225	630	931	910	30.2	31.1	24.7
Puerto Rico.....	325	434	759	3,386	3,972	4,966	9.6	10.9	15.3

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. "All degrees" includes bachelor's, master's, and doctoral degrees; advanced degrees include only master's and doctoral degrees. S&E degrees include degrees in physical, computer, agricultural, biological, earth, atmospheric, ocean, and social sciences; psychology; mathematics; and engineering.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, various years.

Bachelor's Degree Holders as Share of Workforce

Figure 8-8
 Quartile groups for bachelor's degree holders as share of workforce: 2002



1st quartile (59.7–37.9 percent)	2nd quartile (37.9–33.2 percent)	3rd quartile (33.0–30.4 percent)	4th quartile (30.3–24.3 percent)
Colorado	Arizona	Alabama	Arkansas
Connecticut	California	Alaska	Idaho
District of Columbia	Delaware	Georgia	Iowa
Hawaii	Florida	Indiana	Mississippi
Maryland	Illinois	Kentucky	Nevada
Massachusetts	Kansas	Louisiana	North Carolina
New Hampshire	Maine	Michigan	Oklahoma
New Jersey	Minnesota	Montana	South Dakota
New York	Missouri	Nebraska	Tennessee
Rhode Island	New Mexico	North Dakota	Utah
Vermont	Ohio	South Carolina	West Virginia
Virginia	Oregon	Texas	Wyoming
Washington	Pennsylvania	Wisconsin	

SOURCES: U.S. Bureau of the Census, Population Division, Education and Stratification Branch, *Educational Attainment in the United States*; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics. See table 8-8.

Bachelor's degrees are considered an indicator of a well-educated workforce because of the clear advantage they provide over less educational attainment in terms of expected lifetime earnings. The indicator is expressed as the percentage of workers in a state's workforce who hold at least a bachelor's degree. A high value for this indicator denotes that the state has a large percentage of workers who completed an undergraduate education.

Degree data, based on the Census Bureau's Current Population Survey (CPS), are limited to individuals who are age 25 or older. Civilian workforce data are Bureau of Labor Statistics estimates based on CPS. Estimates for sparsely populated states and the District of Columbia may be imprecise because of their small representation in the survey samples.

Findings

- In 2002, there were 48.7 million bachelor's degree holders in the United States, up from 35.6 million in 1993.
- The nationwide value of this indicator rose from 29.6 percent in 1993 to 35.6 percent in 2002, indicating a significant increase in the number and percentage of workers who completed a baccalaureate.
- The proportion of the workforce with a bachelor's degree increased considerably in many states, possibly reflecting the states' attraction of younger cohorts of workers with relatively more college-educated people than older cohorts or a restructuring of their economies.
- The geographic distribution of bachelor's degree holders in the workforce bears little resemblance to any of the degree-based indicators, attesting to the considerable mobility of the U.S. college-educated population.

Table 8-8
Bachelor's degree holders as share of workforce, by state: 1993, 1997, and 2002

State	Bachelor's degree holders (thousands)			Workforce			Bachelor's degree holders in workforce (percent)		
	1993	1997	2002	1993	1997	2002	1993	1997	2002
All states.....	35,605	40,695	48,697	120,303,214	129,540,407	136,945,620	29.6	31.4	35.6
Alabama.....	380	535	652	1,845,425	2,057,160	1,978,462	20.6	26.0	33.0
Alaska.....	73	106	98	274,788	289,735	297,831	26.6	36.6	32.9
Arizona.....	544	561	837	1,715,112	2,080,658	2,506,677	31.7	27.0	33.4
Arkansas.....	234	233	310	1,092,878	1,147,974	1,215,663	21.4	20.3	25.5
California.....	4,922	5,563	5,847	13,918,275	14,942,526	16,241,776	35.4	37.2	36.0
Colorado.....	645	688	993	1,800,035	2,080,012	2,297,565	35.8	33.1	43.2
Connecticut.....	612	655	754	1,672,617	1,634,771	1,696,155	36.6	40.1	44.5
Delaware.....	105	127	153	354,352	365,650	405,339	29.6	34.7	37.7
District of Columbia.....	133	125	170	280,873	237,189	284,553	47.4	52.7	59.7
Florida.....	1,847	2,137	2,840	6,191,793	6,780,081	7,642,161	29.8	31.5	37.2
Georgia.....	883	1,045	1,284	3,265,259	3,727,295	4,071,469	27.0	28.0	31.5
Hawaii.....	194	172	214	560,898	556,673	557,456	34.6	30.9	38.4
Idaho.....	122	142	169	513,653	600,465	644,572	23.8	23.6	26.2
Illinois.....	1,677	1,857	2,208	5,570,146	5,912,684	5,963,317	30.1	31.4	37.0
Indiana.....	506	608	962	2,785,578	2,978,607	3,011,785	18.2	20.4	31.9
Iowa.....	330	397	431	1,497,084	1,527,935	1,600,709	22.0	26.0	26.9
Kansas.....	383	434	508	1,256,952	1,326,289	1,342,010	30.5	32.7	37.9
Kentucky.....	410	438	566	1,689,935	1,812,779	1,856,567	24.3	24.2	30.5
Louisiana.....	420	478	599	1,746,168	1,889,133	1,882,731	24.1	25.3	31.8
Maine.....	168	167	218	582,047	625,790	656,064	28.9	26.7	33.2
Maryland.....	849	1,055	1,298	2,505,102	2,640,878	2,771,882	33.9	39.9	46.8
Massachusetts.....	1,188	1,360	1,494	2,945,402	3,130,763	3,301,276	40.3	43.4	45.3
Michigan.....	1,128	1,273	1,485	4,418,025	4,752,196	4,691,095	25.5	26.8	31.7
Minnesota.....	655	835	997	2,349,196	2,537,651	2,789,929	27.9	32.9	35.7
Mississippi.....	274	346	367	1,138,166	1,189,825	1,209,733	24.1	29.1	30.3
Missouri.....	647	780	948	2,489,049	2,768,598	2,825,055	26.0	28.2	33.6
Montana.....	112	142	140	400,259	430,261	442,472	28.0	33.0	31.6
Nebraska.....	186	222	288	835,581	881,901	924,870	22.3	25.2	31.1
Nevada.....	150	215	300	689,404	846,319	1,059,890	21.8	25.4	28.3
New Hampshire.....	199	209	263	575,418	625,386	672,363	34.6	33.4	39.1
New Jersey.....	1,440	1,506	1,851	3,690,762	3,976,900	4,112,788	39.0	37.9	45.0
New Mexico.....	214	249	283	697,828	763,254	829,775	30.7	32.6	34.1
New York.....	2,807	3,051	3,571	7,973,256	8,276,305	8,789,721	35.2	36.9	40.6
North Carolina.....	811	1,075	1,150	3,380,985	3,702,936	3,890,025	24.0	29.0	29.6
North Dakota.....	80	80	107	306,234	338,691	332,199	26.1	23.6	32.2
Ohio.....	1,385	1,553	1,840	5,130,907	5,452,225	5,497,213	27.0	28.5	33.5
Oklahoma.....	409	433	441	1,435,793	1,529,590	1,616,774	28.5	28.3	27.3
Oregon.....	459	507	601	1,479,939	1,626,986	1,695,275	31.0	31.2	35.5
Pennsylvania.....	1,516	1,837	2,142	5,470,346	5,666,669	5,933,923	27.7	32.4	36.1
Rhode Island.....	134	171	211	471,628	475,819	528,231	28.4	35.9	39.9
South Carolina.....	371	447	603	1,686,920	1,844,062	1,851,214	22.0	24.2	32.6
South Dakota.....	87	90	116	348,461	374,362	407,883	25.0	24.0	28.4
Tennessee.....	477	609	797	2,356,704	2,564,781	2,776,401	20.2	23.7	28.7
Texas.....	2,382	2,624	3,307	8,503,521	9,309,966	10,069,800	28.0	28.2	32.8
Utah.....	207	290	326	879,788	1,006,997	1,107,946	23.5	28.8	29.4
Vermont.....	92	89	130	298,748	314,053	335,623	30.8	28.3	38.7
Virginia.....	1,039	1,236	1,612	3,207,393	3,273,222	3,583,240	32.4	37.8	45.0
Washington.....	907	933	1,089	2,495,453	2,839,863	2,871,015	36.3	32.9	37.9
West Virginia.....	142	182	195	702,895	747,677	755,288	20.2	24.3	25.8
Wisconsin.....	618	760	869	2,598,025	2,840,345	2,860,916	23.8	26.8	30.4
Wyoming.....	52	68	63	228,158	238,520	258,943	22.8	28.5	24.3
Puerto Rico.....	NA	NA	NA	1,003,885	1,131,925	1,189,957	NA	NA	NA

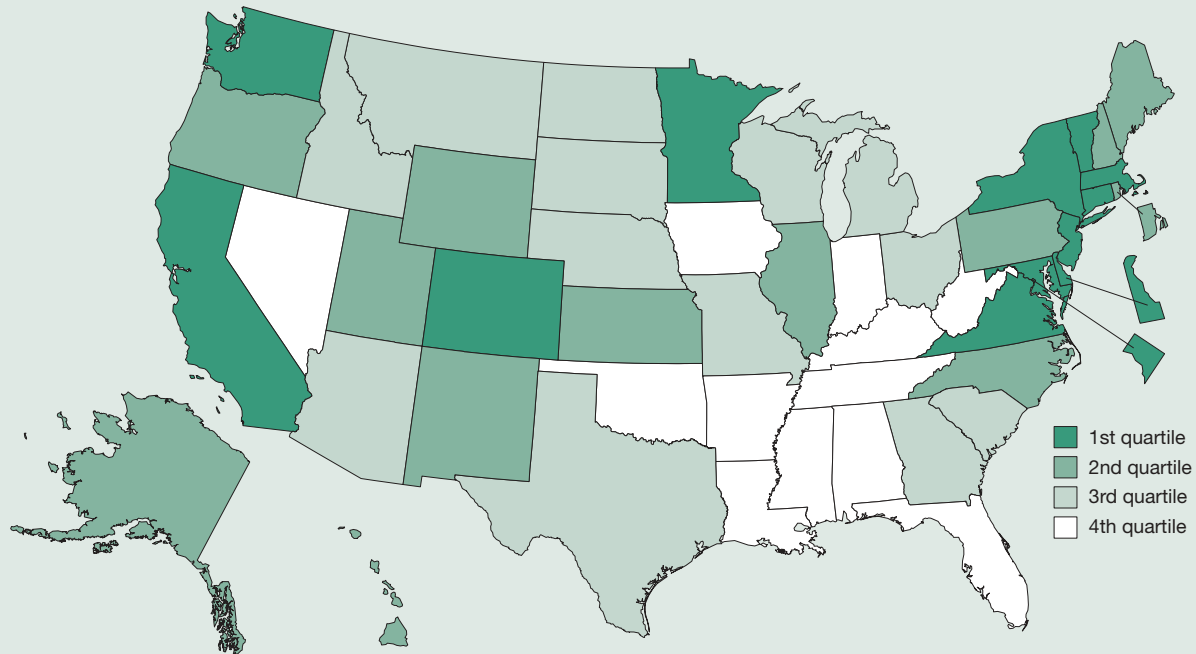
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. Bachelor's degree holders include those who have completed a bachelor's degree or higher. Workforce represents the employed component of the civilian labor force and is reported as annual data, not seasonally adjusted.

SOURCES: U.S. Bureau of the Census, Population Division, Education and Social Stratification Branch, *Educational Attainment in the United States*, various years; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics.

Scientists and Engineers as Share of Workforce

Figure 8-9
Quartile groups for scientists and engineers as share of workforce: 1999



1st quartile (67.30–9.53 percent)	2nd quartile (9.46–7.44 percent)	3rd quartile (7.43–6.25 percent)	4th quartile (6.17–4.19 percent)
California	Alaska	Arizona	Alabama
Colorado	Hawaii	Georgia	Arkansas
Connecticut	Illinois	Idaho	Florida
Delaware	Kansas	Michigan	Indiana
District of Columbia	Maine	Missouri	Iowa
Maryland	New Hampshire	Montana	Kentucky
Massachusetts	New Mexico	Nebraska	Louisiana
Minnesota	North Carolina	North Dakota	Mississippi
New Jersey	Oregon	Ohio	Nevada
New York	Pennsylvania	South Carolina	Oklahoma
Vermont	Rhode Island	South Dakota	Tennessee
Virginia	Utah	Texas	West Virginia
Washington	Wyoming	Wisconsin	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT); and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics. See table 8-9.

This indicator shows the extent to which a state’s workforce provides a labor pool with the training to work in technical areas or in jobs with technical content. Scientists and engineers are people with a bachelor’s or higher degree in a science or engineering field or who worked in an S&E occupation in 1993.

Civilian workforce data are Bureau of Labor Statistics (BLS) estimates

based on the Current Population Survey. BLS data are based on residence location, whereas data for scientists and engineers are largely classified based on work location. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Findings

- In 1999, 10.9 million scientists and engineers were employed in the United States, up from 10.1 million in 1995.
- The nation’s overall workforce grew at essentially the same rate, keeping the proportion of scientists and engineers at around 8 percent of the civilian workforce for the period.
- Large workforce shares of scientists and engineers are evident on both U.S. coasts and in the southern Rocky Mountain area.

Table 8-9
Scientists and engineers as share of workforce, by state: 1995, 1997, and 1999

State	Employed scientists and engineers			Workforce			Scientists and engineers in workforce (percent)		
	1995	1997	1999	1995	1997	1999	1995	1997	1999
All states.....	10,093,900	10,551,600	10,935,300	125,091,085	129,540,407	133,397,374	8.07	8.15	8.20
Alabama.....	111,900	114,800	120,600	1,938,772	2,057,160	2,038,912	5.77	5.58	5.91
Alaska.....	26,500	27,200	24,000	280,829	289,735	298,577	9.44	9.39	8.04
Arizona.....	139,100	145,500	145,100	2,079,452	2,080,658	2,255,117	6.69	6.99	6.43
Arkansas.....	42,600	50,000	55,000	1,160,396	1,147,974	1,173,971	3.67	4.36	4.68
California.....	1,430,500	1,461,200	1,499,300	14,202,849	14,942,526	15,731,727	10.07	9.78	9.53
Colorado.....	230,100	246,000	264,000	2,000,022	2,080,012	2,198,147	11.50	11.83	12.01
Connecticut.....	191,400	192,000	196,100	1,616,855	1,634,771	1,654,455	11.84	11.74	11.85
Delaware.....	41,000	44,000	44,500	365,413	365,650	375,970	11.22	12.03	11.84
District of Columbia.....	180,200	169,000	177,100	258,833	237,189	263,158	69.62	71.25	67.30
Florida.....	378,100	391,200	403,800	6,474,776	6,780,081	7,076,924	5.84	5.77	5.71
Georgia.....	247,800	258,900	266,900	3,440,859	3,727,295	3,916,080	7.20	6.95	6.82
Hawaii.....	55,000	48,000	46,200	542,632	556,673	559,587	10.14	8.62	8.26
Idaho.....	39,300	43,500	42,100	568,138	600,465	617,393	6.92	7.24	6.82
Illinois.....	457,700	481,900	480,700	5,796,094	5,912,684	6,105,124	7.90	8.15	7.87
Indiana.....	161,200	171,700	184,000	2,980,499	2,978,607	2,982,597	5.41	5.76	6.17
Iowa.....	78,300	88,200	88,200	1,505,094	1,527,935	1,532,729	5.20	5.77	5.75
Kansas.....	109,400	112,000	117,200	1,278,543	1,326,289	1,391,523	8.56	8.44	8.42
Kentucky.....	89,500	90,700	86,600	1,760,990	1,812,779	1,878,686	5.08	5.00	4.61
Louisiana.....	99,900	93,700	94,500	1,818,362	1,889,133	1,947,655	5.49	4.96	4.85
Maine.....	45,600	49,900	52,900	603,231	625,790	642,471	7.56	7.97	8.23
Maryland.....	269,400	285,000	298,800	2,576,688	2,640,878	2,676,488	10.46	10.79	11.16
Massachusetts.....	413,900	430,300	445,900	2,994,372	3,130,763	3,179,102	13.82	13.74	14.03
Michigan.....	300,300	323,900	344,000	4,556,351	4,752,196	4,950,204	6.59	6.82	6.95
Minnesota.....	226,900	245,400	264,000	2,498,821	2,537,651	2,627,437	9.08	9.67	10.05
Mississippi.....	53,600	53,500	55,900	1,180,018	1,189,825	1,202,968	4.54	4.50	4.65
Missouri.....	160,000	169,300	181,100	2,697,866	2,768,598	2,745,464	5.93	6.12	6.60
Montana.....	29,200	33,000	33,400	411,306	430,261	449,361	7.10	7.67	7.43
Nebraska.....	56,400	62,400	63,900	874,357	881,901	885,755	6.45	7.08	7.21
Nevada.....	38,300	38,300	37,700	758,992	846,319	899,737	5.05	4.53	4.19
New Hampshire.....	50,000	56,900	61,500	608,088	625,386	649,969	8.22	9.10	9.46
New Jersey.....	374,500	379,000	386,400	3,803,748	3,976,900	4,012,218	9.85	9.53	9.63
New Mexico.....	67,500	67,100	70,800	741,426	763,254	763,609	9.10	8.79	9.27
New York.....	800,800	824,700	849,600	7,970,087	8,276,305	8,422,650	10.05	9.96	10.09
North Carolina.....	257,100	282,500	325,600	3,473,478	3,702,936	3,746,412	7.40	7.63	8.69
North Dakota.....	19,300	19,700	21,000	324,613	338,691	325,366	5.95	5.82	6.45
Ohio.....	352,500	387,400	384,400	5,318,880	5,452,225	5,507,825	6.63	7.11	6.98
Oklahoma.....	86,900	96,200	97,200	1,473,610	1,529,590	1,597,865	5.90	6.29	6.08
Oregon.....	124,700	135,400	142,700	1,572,628	1,626,986	1,660,724	7.93	8.32	8.59
Pennsylvania.....	427,800	443,200	457,200	5,494,532	5,666,669	5,713,423	7.79	7.82	8.00
Rhode Island.....	46,400	42,400	42,600	453,512	475,819	483,532	10.23	8.91	8.81
South Carolina.....	101,600	113,700	117,200	1,770,523	1,844,062	1,875,433	5.74	6.17	6.25
South Dakota.....	25,800	26,600	28,800	375,303	374,362	388,072	6.87	7.11	7.42
Tennessee.....	144,600	148,600	151,300	2,560,613	2,564,781	2,702,168	5.65	5.79	5.60
Texas.....	639,700	648,900	678,400	9,011,013	9,309,966	9,746,879	7.10	6.97	6.96
Utah.....	74,800	75,800	77,800	951,372	1,006,997	1,045,501	7.86	7.53	7.44
Vermont.....	33,000	31,600	33,200	305,277	314,053	325,585	10.81	10.06	10.20
Virginia.....	304,500	333,400	347,000	3,325,234	3,273,222	3,429,908	9.16	10.19	10.12
Washington.....	235,900	290,000	313,500	2,630,924	2,839,863	2,929,243	8.97	10.21	10.70
West Virginia.....	32,000	35,200	37,000	723,140	747,677	762,573	4.43	4.71	4.85
Wisconsin.....	168,600	172,300	176,400	2,738,522	2,840,345	2,801,777	6.16	6.07	6.30
Wyoming.....	22,800	20,500	22,200	243,152	238,520	249,323	9.38	8.59	8.90
Puerto Rico.....	NA	NA	NA	1,074,411	1,131,925	1,148,959	NA	NA	NA

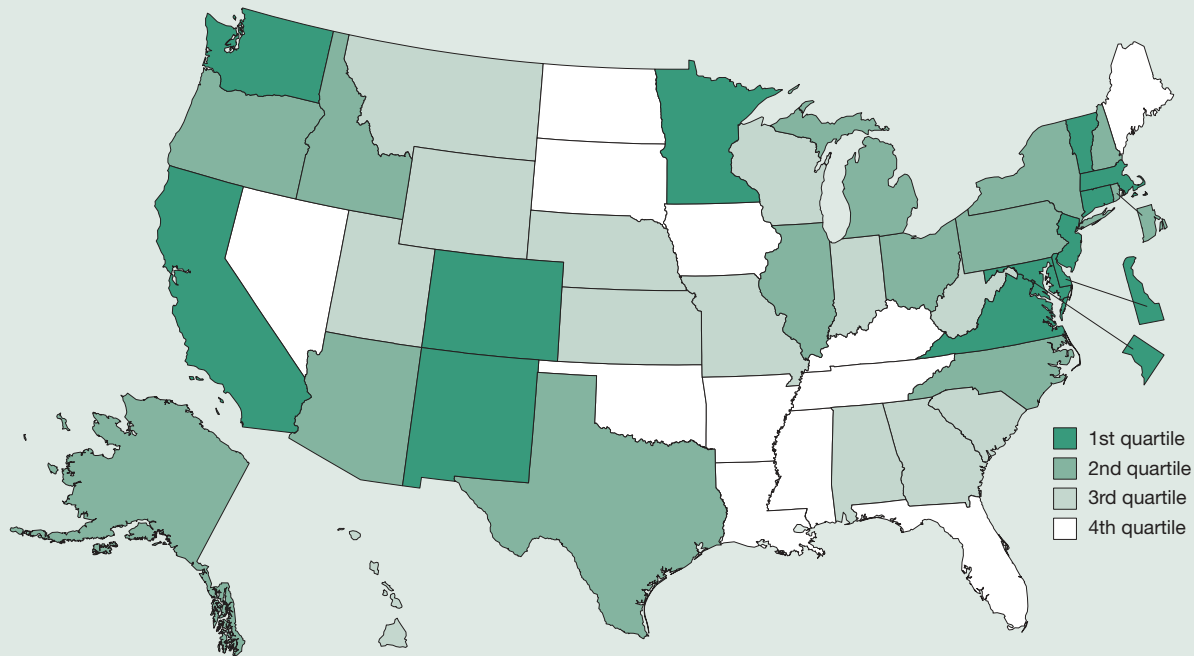
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. Scientists and engineers include people who were employed at time of survey who are included in one of the following groups: (1) have ever received a bachelor's degree or higher in an S&E field or (2) have a non-S&E bachelor's or higher degree and were in an S&E occupation at the time of the 1993 Scientists and Engineers Statistical Data System (SESTAT) surveys. Because SESTAT survey sample designs do not include geography, reliability of estimates in some states may be poor because of small sample size. Workforce represents the employed component of the civilian labor force and is reported as annual data, not seasonally adjusted.

SOURCES: National Science Foundation, Division of Science Resources Statistics, SESTAT; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics.

S&E Occupations as Share of Workforce

Figure 8-10
Quartile groups for individuals in S&E occupations as share of workforce: 1999



1st quartile (20.48–3.02 percent)	2nd quartile (2.94–2.41 percent)	3rd quartile (2.41–1.88 percent)	4th quartile (1.82–1.20 percent)
California	Alaska	Alabama	Arkansas
Colorado	Arizona	Georgia	Florida
Connecticut	Idaho	Hawaii	Iowa
Delaware	Illinois	Indiana	Kentucky
District of Columbia	Michigan	Kansas	Louisiana
Maryland	New Hampshire	Missouri	Maine
Massachusetts	New York	Montana	Mississippi
Minnesota	North Carolina	Nebraska	Nevada
New Jersey	Ohio	South Carolina	North Dakota
New Mexico	Oregon	Utah	Oklahoma
Vermont	Pennsylvania	West Virginia	South Dakota
Virginia	Rhode Island	Wisconsin	Tennessee
Washington	Texas	Wyoming	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT); and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics. See table 8-10.

This indicator shows the extent to which a state’s workforce is college educated and employed in science and engineering occupations. A high value for this indicator shows that a state’s economy has a high percentage of technical jobs relative to other states.

S&E occupations include mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any of these S&E fields. People with job titles such as manager are excluded.

Civilian workforce data are Bureau of Labor Statistics (BLS) estimates based on the Current Population Survey. BLS data are based on residence location, whereas data on people in S&E occupations are largely based on work location. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Findings

- In 1999, about 3.5 million people worked in occupations classified as S&E.
- The concentration of S&E occupations in the workforce varied little since 1995, averaging 2.5–2.6 percent across the United States.
- States located in the Northeast, Southwest, and West Coast tend to be in the top two quartiles on this measure. The District of Columbia is an outlier.

Table 8-10
Individuals in S&E occupations as share of workforce, by state: 1995, 1997, and 1999

State	S&E occupations			Workforce			Workforce in S&E occupations (percent)		
	1995	1997	1999	1995	1997	1999	1995	1997	1999
All states.....	3,178,000	3,357,000	3,525,100	125,091,085	129,540,407	133,397,374	2.54	2.59	2.64
Alabama.....	40,800	44,300	43,300	1,938,772	2,057,160	2,038,912	2.10	2.15	2.12
Alaska.....	6,600	6,300	7,700	280,829	289,735	298,577	2.35	2.17	2.58
Arizona.....	47,400	54,000	55,700	2,079,452	2,080,658	2,255,117	2.28	2.60	2.47
Arkansas.....	14,100	15,300	16,900	1,160,396	1,147,974	1,173,971	1.22	1.33	1.44
California.....	463,900	478,000	492,000	14,202,849	14,942,526	15,731,727	3.27	3.20	3.13
Colorado.....	82,700	88,500	96,900	2,000,022	2,080,012	2,198,147	4.13	4.25	4.41
Connecticut.....	56,900	53,300	57,500	1,616,855	1,634,771	1,654,455	3.52	3.26	3.48
Delaware.....	14,300	15,700	16,300	365,413	365,650	375,970	3.91	4.29	4.34
District of Columbia.....	53,200	51,300	53,900	258,833	237,189	263,158	20.55	21.63	20.48
Florida.....	105,500	116,600	123,000	6,474,776	6,780,081	7,076,924	1.63	1.72	1.74
Georgia.....	69,800	75,600	85,900	3,440,859	3,727,295	3,916,080	2.03	2.03	2.19
Hawaii.....	13,100	11,500	11,700	542,632	556,673	559,587	2.41	2.07	2.09
Idaho.....	13,200	13,900	15,500	568,138	600,465	617,393	2.32	2.31	2.51
Illinois.....	138,300	148,600	155,200	5,796,094	5,912,684	6,105,124	2.39	2.51	2.54
Indiana.....	51,300	54,000	56,000	2,980,499	2,978,607	2,982,597	1.72	1.81	1.88
Iowa.....	22,100	24,500	23,900	1,505,094	1,527,935	1,532,729	1.47	1.60	1.56
Kansas.....	29,500	34,300	31,400	1,278,543	1,326,289	1,391,523	2.31	2.59	2.26
Kentucky.....	22,700	23,100	26,100	1,760,990	1,812,779	1,878,686	1.29	1.27	1.39
Louisiana.....	35,900	36,200	35,500	1,818,362	1,889,133	1,947,655	1.97	1.92	1.82
Maine.....	7,900	11,600	11,200	603,231	625,790	642,471	1.31	1.85	1.74
Maryland.....	93,300	93,900	104,100	2,576,688	2,640,878	2,676,488	3.62	3.56	3.89
Massachusetts.....	130,900	136,600	148,800	2,994,372	3,130,763	3,179,102	4.37	4.36	4.68
Michigan.....	116,700	122,900	131,800	4,556,351	4,752,196	4,950,204	2.56	2.59	2.66
Minnesota.....	69,400	76,800	81,600	2,498,821	2,537,651	2,627,437	2.78	3.03	3.11
Mississippi.....	15,700	14,100	16,100	1,180,018	1,189,825	1,202,968	1.33	1.19	1.34
Missouri.....	53,100	59,700	61,000	2,697,866	2,768,598	2,745,464	1.97	2.16	2.22
Montana.....	8,100	10,200	8,600	411,306	430,261	449,361	1.97	2.37	1.91
Nebraska.....	15,300	15,200	19,900	874,357	881,901	885,755	1.75	1.72	2.25
Nevada.....	11,600	10,100	10,800	758,992	846,319	899,737	1.53	1.19	1.20
New Hampshire.....	14,000	17,000	19,100	608,088	625,386	649,969	2.30	2.72	2.94
New Jersey.....	118,900	118,500	121,200	3,803,748	3,976,900	4,012,218	3.13	2.98	3.02
New Mexico.....	25,100	25,900	28,600	741,426	763,254	763,609	3.39	3.39	3.75
New York.....	197,400	206,900	216,000	7,970,087	8,276,305	8,422,650	2.48	2.50	2.56
North Carolina.....	75,000	84,500	93,800	3,473,478	3,702,936	3,746,412	2.16	2.28	2.50
North Dakota.....	4,500	4,300	4,700	324,613	338,691	325,366	1.39	1.27	1.44
Ohio.....	119,900	138,600	132,900	5,318,880	5,452,225	5,507,825	2.25	2.54	2.41
Oklahoma.....	25,500	28,600	28,100	1,473,610	1,529,590	1,597,865	1.73	1.87	1.76
Oregon.....	37,800	39,800	43,400	1,572,628	1,626,986	1,660,724	2.40	2.45	2.61
Pennsylvania.....	137,700	141,800	143,300	5,494,532	5,666,669	5,713,423	2.51	2.50	2.51
Rhode Island.....	15,600	13,500	14,200	453,512	475,819	483,532	3.44	2.84	2.94
South Carolina.....	31,800	34,200	37,500	1,770,523	1,844,062	1,875,433	1.80	1.85	2.00
South Dakota.....	5,400	5,400	7,000	375,303	374,362	388,072	1.44	1.44	1.80
Tennessee.....	50,400	47,100	44,400	2,560,613	2,564,781	2,702,168	1.97	1.84	1.64
Texas.....	229,600	232,300	254,800	9,011,013	9,309,966	9,746,879	2.55	2.50	2.61
Utah.....	26,100	24,400	25,200	951,372	1,006,997	1,045,501	2.74	2.42	2.41
Vermont.....	8,800	10,200	12,500	305,277	314,053	325,585	2.88	3.25	3.84
Virginia.....	104,500	116,200	124,100	3,325,234	3,273,222	3,429,908	3.14	3.55	3.62
Washington.....	75,800	97,900	101,500	2,630,924	2,839,863	2,929,243	2.88	3.45	3.47
West Virginia.....	12,000	14,100	16,500	723,140	747,677	762,573	1.66	1.89	2.16
Wisconsin.....	52,500	54,000	53,200	2,738,522	2,840,345	2,801,777	1.92	1.90	1.90
Wyoming.....	6,400	5,700	4,800	243,152	238,520	249,323	2.63	2.39	1.93
Puerto Rico.....	NA	NA	NA	1,074,411	1,131,925	1,148,959	NA	NA	NA

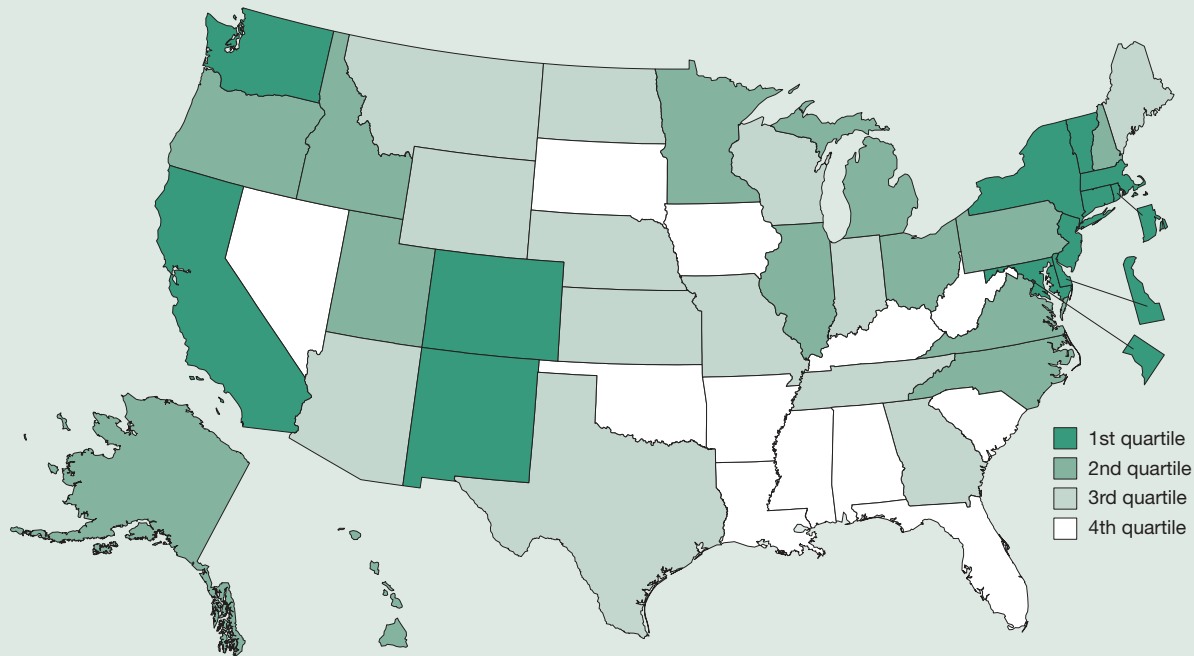
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. Scientists and engineers in an S&E occupation include people who are employed in S&E at the time of survey and are included in one of the following groups: (1) have ever received a bachelor's degree or higher in an S&E field or (2) have a non-S&E bachelor's or higher degree and were in an S&E occupation at the time of the 1993 Scientists and Engineers Statistical Data System (SESTAT) surveys. S&E occupations include mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any of the S&E degree fields. Workforce represents the employed component of the civilian labor force and is reported as annual data, not seasonally adjusted. Because SESTAT survey sample design does not include geography, reliability of estimates for some states may be poor because of small sample size.

SOURCES: National Science Foundation, Division of Science Resources Statistics, SESTAT; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics.

S&E Doctorate Holders as Share of Workforce

Figure 8-11
Quartile groups for S&E doctorate holders as share of workforce: 2001



1st quartile (4.85–0.50 percent)	2nd quartile (0.49–0.34 percent)	3rd quartile (0.33–0.29 percent)	4th quartile (0.28–0.19 percent)
California	Alaska	Arizona	Alabama
Colorado	Hawaii	Georgia	Arkansas
Connecticut	Idaho	Indiana	Florida
Delaware	Illinois	Kansas	Iowa
District of Columbia	Michigan	Maine	Kentucky
Maryland	Minnesota	Missouri	Louisiana
Massachusetts	New Hampshire	Montana	Mississippi
New Jersey	North Carolina	Nebraska	Nevada
New Mexico	Ohio	North Dakota	Oklahoma
New York	Oregon	Tennessee	South Carolina
Rhode Island	Pennsylvania	Texas	South Dakota
Vermont	Utah	Wisconsin	West Virginia
Washington	Virginia	Wyoming	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics. See table 8-11.

This indicator shows a state’s tendency to attract and retain highly trained scientists and engineers. Such people often conduct research and development, manage R&D activities, or are otherwise engaged in knowledge-intensive activities. A high value for this indicator suggests employment opportunities in a state for individuals with highly advanced S&E training.

S&E includes physical, earth, ocean, atmospheric, life, computer, and social sciences; mathematics; engineering; and psychology. S&E

doctorate holders exclude those with doctorates from foreign institutions. The location of the doctorate holders primarily reflects where the individuals work. Civilian workforce data are Bureau of Labor Statistics estimates based on the Current Population Survey, with location based on residence. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Findings

- In 2001, fewer than 0.5 percent of the workforce held an S&E doctorate, little changed from 1993.
- Although the number of employed S&E doctorate holders increased by 24 percent from 1993 to 2001, the size of the total workforce rose at nearly the same rate.
- States in the top quartile tend to be home to major research laboratories, research universities, or research-intensive industries.
- The District of Columbia is an outlier.

Table 8-11
S&E doctorate holders as share of workforce, by state: 1993, 1997, and 2001

State	S&E doctorate holders			Workforce			S&E doctorate holders in workforce (percent)		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
All states.....	461,210	516,580	572,820	120,303,214	129,540,407	137,237,739	0.38	0.40	0.42
Alabama	5,020	6,610	5,330	1,845,425	2,057,160	2,022,294	0.27	0.32	0.26
Alaska.....	1,050	1,110	1,200	274,788	289,735	299,140	0.38	0.38	0.40
Arizona	5,040	6,280	7,070	1,715,112	2,080,658	2,458,074	0.29	0.30	0.29
Arkansas	1,770	2,320	2,560	1,092,878	1,147,974	1,185,171	0.16	0.20	0.22
California	60,490	70,490	80,870	13,918,275	14,942,526	16,260,126	0.43	0.47	0.50
Colorado	8,890	10,740	11,780	1,800,035	2,080,012	2,290,554	0.49	0.52	0.51
Connecticut.....	7,510	8,770	9,490	1,672,617	1,634,771	1,697,977	0.45	0.54	0.56
Delaware	3,500	3,710	3,540	354,352	365,650	414,383	0.99	1.01	0.85
District of Columbia	13,510	11,800	14,200	280,873	237,189	292,531	4.81	4.97	4.85
Florida	11,770	13,330	15,740	6,191,793	6,780,081	7,638,800	0.19	0.20	0.21
Georgia.....	8,130	9,880	11,990	3,265,259	3,727,295	4,053,118	0.25	0.27	0.30
Hawaii.....	2,360	2,550	2,580	560,898	556,673	564,187	0.42	0.46	0.46
Idaho	1,860	2,030	2,230	513,653	600,465	647,043	0.36	0.34	0.34
Illinois	19,160	21,260	22,110	5,570,146	5,912,684	6,124,677	0.34	0.36	0.36
Indiana.....	7,610	7,570	9,580	2,785,578	2,978,607	2,997,804	0.27	0.25	0.32
Iowa.....	3,790	4,120	4,390	1,497,084	1,527,935	1,571,730	0.25	0.27	0.28
Kansas	3,290	3,770	3,970	1,256,952	1,326,289	1,323,950	0.26	0.28	0.30
Kentucky	3,570	4,110	4,590	1,689,935	1,812,779	1,878,273	0.21	0.23	0.24
Louisiana	5,230	5,360	5,290	1,746,168	1,889,133	1,930,874	0.30	0.28	0.27
Maine.....	1,830	2,150	1,990	582,047	625,790	658,478	0.31	0.34	0.30
Maryland	18,390	21,020	22,730	2,505,102	2,640,878	2,727,116	0.73	0.80	0.83
Massachusetts.....	21,360	23,330	29,100	2,945,402	3,130,763	3,268,262	0.73	0.75	0.89
Michigan.....	13,020	15,060	17,380	4,418,025	4,752,196	4,886,276	0.29	0.32	0.36
Minnesota	8,030	9,810	11,410	2,349,196	2,537,651	2,782,644	0.34	0.39	0.41
Mississippi	2,750	3,000	3,170	1,138,166	1,189,825	1,233,922	0.24	0.25	0.26
Missouri.....	7,970	9,490	9,280	2,489,049	2,768,598	2,879,250	0.32	0.34	0.32
Montana	1,460	1,690	1,440	400,259	430,261	441,972	0.36	0.39	0.33
Nebraska.....	2,380	3,010	2,890	835,581	881,901	923,481	0.28	0.34	0.31
Nevada	1,380	1,620	2,030	689,404	846,319	1,044,918	0.20	0.19	0.19
New Hampshire	1,990	2,230	2,470	575,418	625,386	675,516	0.35	0.36	0.37
New Jersey	19,320	20,440	22,740	3,690,762	3,976,900	4,124,564	0.52	0.51	0.55
New Mexico	6,320	7,480	7,750	697,828	763,254	819,755	0.91	0.98	0.95
New York.....	39,110	40,080	43,990	7,973,256	8,276,305	8,688,691	0.49	0.48	0.51
North Carolina.....	12,220	13,730	16,760	3,380,985	3,702,936	3,971,115	0.36	0.37	0.42
North Dakota.....	1,200	1,350	1,080	306,234	338,691	335,951	0.39	0.40	0.32
Ohio.....	16,700	18,700	20,070	5,130,907	5,452,225	5,595,965	0.33	0.34	0.36
Oklahoma.....	4,410	4,580	4,360	1,435,793	1,529,590	1,607,037	0.31	0.30	0.27
Oregon	5,600	6,210	7,040	1,479,939	1,626,986	1,701,685	0.38	0.38	0.41
Pennsylvania	21,990	23,940	26,140	5,470,346	5,666,669	5,920,292	0.40	0.42	0.44
Rhode Island	2,060	2,450	2,640	471,628	475,819	521,996	0.44	0.51	0.51
South Carolina	4,310	4,780	5,130	1,686,920	1,844,062	1,847,944	0.26	0.26	0.28
South Dakota	930	1,060	1,000	348,461	374,362	397,752	0.27	0.28	0.25
Tennessee	7,660	8,520	8,990	2,356,704	2,564,781	2,733,441	0.33	0.33	0.33
Texas	25,880	28,570	32,490	8,503,521	9,309,966	10,048,069	0.30	0.31	0.32
Utah.....	3,720	4,800	4,820	879,788	1,006,997	1,110,359	0.42	0.48	0.43
Vermont.....	1,500	1,760	1,750	298,748	314,053	327,614	0.50	0.56	0.53
Virginia.....	13,710	15,250	17,460	3,207,393	3,273,222	3,555,720	0.43	0.47	0.49
Washington	10,570	13,360	14,760	2,495,453	2,839,863	2,822,226	0.42	0.47	0.52
West Virginia.....	1,760	1,980	1,890	702,895	747,677	782,034	0.25	0.26	0.24
Wisconsin.....	7,410	8,460	8,720	2,598,025	2,840,345	2,891,294	0.29	0.30	0.30
Wyoming.....	720	860	840	228,158	238,520	261,694	0.32	0.36	0.32
Puerto Rico	NA	NA	NA	1,003,885	1,131,925	1,149,521	NA	NA	NA

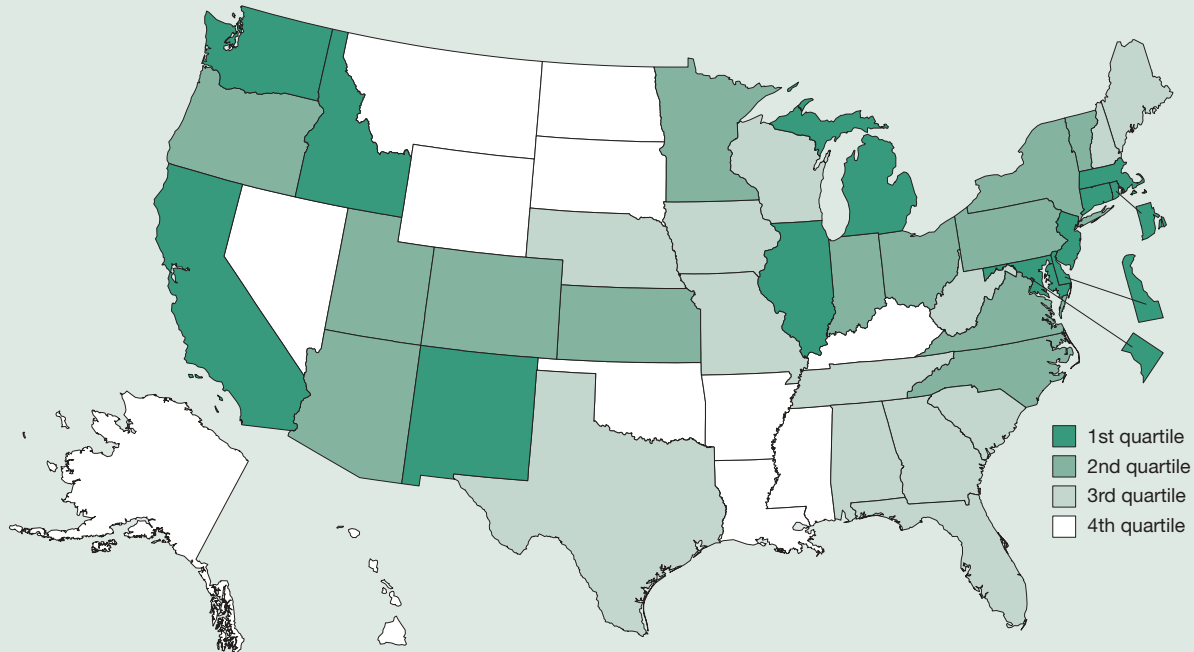
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. The Survey of Doctorate Recipients sample design does not include geography. Data on S&E doctorate holders are classified by employment location and workforce data based on respondents' residence. Thus, reliability of data for areas with smaller populations is lower than for more populous states. Workforce represents the employed component of the civilian labor force and is reported as annual data, not seasonally adjusted.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics.

R&D as Share of Gross State Product

Figure 8-12
Quartile groups for R&D as share of GSP: 2000



1st quartile (5.87–2.74 percent)	2nd quartile (2.57–1.68 percent)	3rd quartile (1.64–0.79 percent)	4th quartile (0.79–0.32 percent)
California	Arizona	Alabama	Alaska
Connecticut	Colorado	Florida	Arkansas
Delaware	Indiana	Georgia	Hawaii
District of Columbia	Kansas	Iowa	Kentucky
Idaho	Minnesota	Maine	Louisiana
Illinois	New York	Missouri	Mississippi
Maryland	North Carolina	Nebraska	Montana
Massachusetts	Ohio	New Hampshire	Nevada
Michigan	Oregon	South Carolina	North Dakota
New Jersey	Pennsylvania	Tennessee	Oklahoma
New Mexico	Utah	Texas	South Dakota
Rhode Island	Vermont	West Virginia	Wyoming
Washington	Virginia	Wisconsin	

SOURCES: National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*; U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data; and Government of Puerto Rico, Office of the Governor. See table 8-12.

This indicator shows the extent to which research and development play a role in a state’s economy. A high value indicates that the state has a high intensity of R&D activity that may support future growth in knowledge-based industries.

R&D refers to R&D activities performed by Federal agencies, industry, universities, and other nonprofit organizations. Data for the value of gross state product (GSP) and for R&D expenditures are shown in current dollars.

Findings

- In 2000, R&D accounted for about 2.5 percent of U.S. gross domestic product, fluctuating in the 2.4–2.7 percent range over the past decade.
- Although the state distribution on this indicator bears some similarity to that of doctoral-level scientists and engineers in the workforce, it also reflects the different costs associated with different types of R&D.
- Changes in both R&D projects and GSP growth trends affect this indicator, especially for small state economies or states with large research facilities. In fact, some states experienced considerable shifts in R&D intensity over the decade, as measured by this indicator.

Table 8-12
R&D as share of GSP, by state: 1991, 1995, and 2000

State	R&D performed (thousands of dollars)			GSP (millions of dollars)			R&D performed/GSP		
	1991	1995	2000	1991	1995	2000	1991	1995	2000
All states.....	160,521,000	177,166,037	244,855,083	5,895,431	7,309,513	9,891,183	2.72	2.42	2.48
Alabama.....	1,510,827	1,680,828	1,730,117	75,977	95,514	119,319	1.99	1.76	1.45
Alaska.....	146,091	163,396	196,448	22,021	24,791	28,129	0.66	0.66	0.70
Arizona.....	1,398,709	1,957,119	3,107,291	71,876	104,586	153,469	1.95	1.87	2.02
Arkansas.....	198,271	329,500	454,401	41,277	53,809	66,793	0.48	0.61	0.68
California.....	28,346,287	36,035,609	55,092,936	814,743	925,931	1,330,025	3.48	3.89	4.14
Colorado.....	NA	2,700,684	4,229,501	79,448	109,021	169,341	NA	2.48	2.50
Connecticut.....	1,917,105	4,310,652	4,888,469	100,395	118,645	161,929	1.91	3.63	3.02
Delaware.....	NA	1,148,632	1,532,130	22,169	27,575	37,247	NA	4.17	4.11
District of Columbia.....	1,736,670	3,128,187	2,296,233	42,240	48,408	59,963	4.11	6.46	3.83
Florida.....	3,699,966	5,222,709	4,662,727	269,845	344,771	471,623	1.37	1.51	0.99
Georgia.....	1,478,861	2,112,474	2,796,192	148,722	203,505	295,539	0.99	1.04	0.95
Hawaii.....	144,656	169,252	291,409	34,002	37,243	42,524	0.43	0.45	0.69
Idaho.....	NA	913,961	1,433,567	18,655	27,155	36,755	NA	3.37	3.90
Illinois.....	6,413,236	7,482,753	12,767,496	285,719	359,451	466,312	2.24	2.08	2.74
Indiana.....	2,346,791	3,162,376	3,252,494	114,188	148,447	189,778	2.06	2.13	1.71
Iowa.....	777,130	1,391,005	1,017,300	57,698	71,687	89,654	1.35	1.94	1.13
Kansas.....	NA	763,702	1,420,089	53,576	64,069	84,526	NA	1.19	1.68
Kentucky.....	316,616	593,797	866,052	70,834	91,472	117,233	0.45	0.65	0.74
Louisiana.....	453,098	422,967	626,793	95,918	112,157	144,984	0.47	0.38	0.43
Maine.....	NA	345,449	318,726	23,635	27,987	36,276	NA	1.23	0.88
Maryland.....	5,736,048	6,865,287	8,633,558	117,630	139,495	185,049	4.88	4.92	4.67
Massachusetts.....	8,565,279	9,969,508	13,004,427	161,517	197,469	283,072	5.30	5.05	4.59
Michigan.....	8,850,565	13,274,875	18,892,070	194,230	254,179	323,717	4.56	5.22	5.84
Minnesota.....	2,227,672	3,087,438	4,298,967	103,923	131,841	186,097	2.14	2.34	2.31
Mississippi.....	302,380	314,710	512,789	41,311	54,562	66,162	0.73	0.58	0.78
Missouri.....	NA	2,498,360	2,583,036	110,396	139,547	177,104	NA	1.79	1.46
Montana.....	NA	119,109	169,856	14,075	17,537	21,702	NA	0.68	0.78
Nebraska.....	210,756	335,930	438,996	35,482	44,084	55,649	0.59	0.76	0.79
Nevada.....	261,232	445,028	377,412	33,665	49,377	75,533	0.78	0.90	0.50
New Hampshire.....	NA	597,697	775,004	24,948	32,388	47,385	NA	1.85	1.64
New Jersey.....	8,777,671	9,128,185	13,133,222	224,307	271,435	357,453	3.91	3.36	3.67
New Mexico.....	2,589,385	3,295,475	3,085,199	30,862	42,170	52,592	8.39	7.81	5.87
New York.....	10,315,493	10,954,561	13,555,586	504,665	597,593	798,382	2.04	1.83	1.70
North Carolina.....	1,965,076	3,191,790	5,045,250	147,473	194,634	272,934	1.33	1.64	1.85
North Dakota.....	NA	97,606	145,671	11,634	14,529	18,556	NA	0.67	0.79
Ohio.....	5,975,241	5,314,554	7,661,540	235,876	295,668	370,617	2.53	1.80	2.07
Oklahoma.....	604,019	528,764	659,684	59,698	69,960	90,942	1.01	0.76	0.73
Oregon.....	600,175	1,088,654	2,116,232	60,602	81,092	121,383	0.99	1.34	1.74
Pennsylvania.....	7,620,947	6,918,955	9,841,912	260,591	318,765	399,488	2.92	2.17	2.46
Rhode Island.....	484,693	896,570	1,500,828	21,758	25,703	36,086	2.23	3.49	4.16
South Carolina.....	594,444	996,261	1,126,164	68,776	86,880	112,197	0.86	1.15	1.00
South Dakota.....	32,297	54,667	84,801	14,093	18,257	23,452	0.23	0.30	0.36
Tennessee.....	1,142,486	1,394,231	2,057,293	102,049	136,821	177,401	1.12	1.02	1.16
Texas.....	6,635,249	8,384,534	11,552,437	403,286	513,882	738,270	1.65	1.63	1.56
Utah.....	664,474	1,144,080	1,360,644	33,658	46,290	68,430	1.97	2.47	1.99
Vermont.....	NA	308,180	465,349	11,771	13,974	18,124	NA	2.21	2.57
Virginia.....	2,775,919	3,897,444	5,069,481	153,965	188,963	260,837	1.80	2.06	1.94
Washington.....	3,889,660	5,240,679	10,516,331	122,453	151,265	218,095	3.18	3.46	4.82
West Virginia.....	NA	475,040	457,128	29,331	36,315	40,926	NA	1.31	1.12
Wisconsin.....	1,573,365	2,226,046	2,692,876	104,918	133,694	173,016	1.50	1.67	1.56
Wyoming.....	41,037	86,767	60,969	13,550	14,920	19,113	0.30	0.58	0.32
Puerto Rico.....	NA	NA	NA	22,809	28,452	41,366	NA	NA	NA

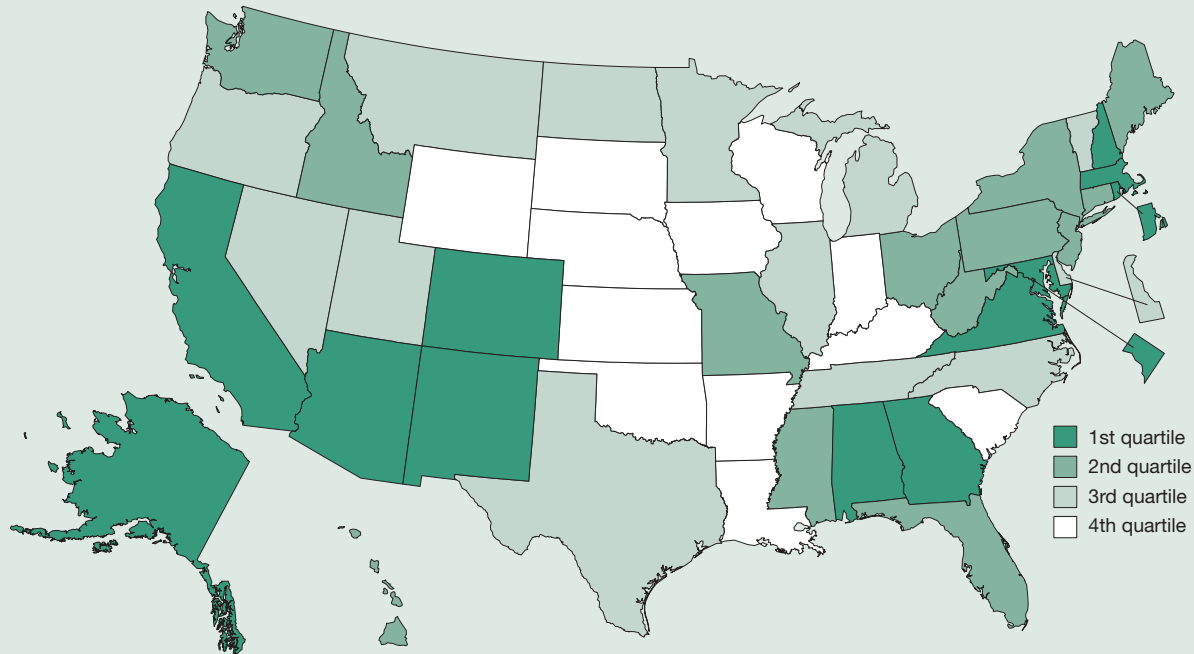
GSP gross state product
NA not available

NOTES: The state total for R&D in 1991 is based on the reported value for the nation in *National Patterns of R&D Resources 1998*, table B-1A. 1995 and 2000 R&D are based on the sum of the 50 states plus the District of Columbia. Total R&D includes R&D performed by Federal agencies, industry, universities, and other nonprofit organizations. The GSP total for each year is the sum of the 50 states and the District of Columbia. Total R&D and GSP are reported in current dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, various years; U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data; and Government of Puerto Rico, Office of the Governor.

Federal R&D Obligations per Civilian Worker

Figure 8-13
Quartile groups for Federal R&D obligations per civilian worker: 2000



1st quartile (\$8,113–\$471)	2nd quartile (\$469–\$295)	3rd quartile (\$289–\$175)	4th quartile (\$173–\$96)
Alabama	Connecticut	Delaware	Arkansas
Alaska	Florida	Illinois	Indiana
Arizona	Hawaii	Michigan	Iowa
California	Idaho	Minnesota	Kansas
Colorado	Maine	Montana	Kentucky
District of Columbia	Mississippi	Nevada	Louisiana
Georgia	Missouri	North Carolina	Nebraska
Maryland	New Jersey	North Dakota	Oklahoma
Massachusetts	New York	Oregon	South Carolina
New Hampshire	Ohio	Tennessee	South Dakota
New Mexico	Pennsylvania	Texas	Wisconsin
Rhode Island	Washington	Utah	Wyoming
Virginia	West Virginia	Vermont	

SOURCES: National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development*; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics. See table 8-13.

This indicator shows how Federal research and development funding is disbursed geographically relative to the size of states' civilian workforces. Federal R&D funding is largely for development, but it may provide direct and indirect benefits to a state's economy and may stimulate the conduct of basic research. A high value for this indicator may indicate the existence of major federally funded R&D facilities or the presence of large defense contractors in the state.

Federal R&D dollars are counted where they are obligated; they may be expended in many locations. Civilian workforce data are Bureau of Labor Statistics estimates based on the Current Population Survey, with location based on residence. Because of these differences and the sample-based nature of the population data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Findings

- Federal Government obligations to the states totaled \$63.8 billion in 1992, \$66.1 billion in 1996, and \$71.0 billion in 2000 for R&D.
- Per civilian worker, this yielded a declining average over the period—\$538 at the beginning of the period to \$519 in 2000—because the workforce grew faster than Federal R&D funding.
- The state-by-state picture is marked by many sharp increases and decreases over the decade, reflecting both changes in jobs and changes in the level of Federal R&D funds.
- A high score is evident for states in the national capital area. Overall, the distribution of funds is highly skewed, with only 11 states above the state average.

Table 8-13
Federal R&D obligations per civilian worker, by state: 1992, 1996, and 2000

State	Federal R&D obligations (thousands of dollars)			Civilian workers			Federal R&D obligations per civilian worker (dollars)		
	1992	1996	2000	1992	1996	2000	1992	1996	2000
All states.....	63,818,372	66,071,314	71,034,535	118,534,413	126,902,959	136,927,182	538	521	519
Alabama.....	2,151,670	2,178,776	1,614,901	1,816,751	1,990,992	2,042,827	1,184	1,094	791
Alaska.....	92,966	93,334	146,777	261,155	288,511	297,455	356	324	493
Arizona.....	638,209	706,673	1,121,701	1,673,329	2,087,744	2,381,921	381	338	471
Arkansas.....	68,848	148,166	116,333	1,069,498	1,164,104	1,207,006	64	127	96
California.....	15,999,143	12,658,120	14,082,960	13,973,304	14,391,485	16,048,937	1,145	880	878
Colorado.....	1,479,238	1,277,553	1,369,733	1,710,242	2,004,741	2,286,203	865	637	599
Connecticut.....	578,332	798,866	806,228	1,680,758	1,619,809	1,743,504	344	493	462
Delaware.....	43,065	64,865	69,867	346,265	363,315	399,874	124	179	175
District of Columbia.....	2,185,196	2,574,139	2,374,647	283,586	247,800	292,704	7,706	10,388	8,113
Florida.....	2,832,290	2,957,866	2,216,206	6,015,795	6,603,424	7,520,377	471	448	295
Georgia.....	2,512,567	4,137,785	2,632,186	3,119,071	3,566,542	4,094,668	806	1,160	643
Hawaii.....	150,654	147,574	209,737	557,430	555,747	566,142	270	266	370
Idaho.....	299,457	244,579	216,928	497,343	584,873	624,829	602	418	347
Illinois.....	921,924	1,094,284	1,404,613	5,561,305	5,839,807	6,243,968	166	187	225
Indiana.....	367,003	439,766	506,326	2,652,386	2,938,752	3,020,326	138	150	168
Iowa.....	194,674	213,370	267,038	1,440,385	1,533,334	1,547,772	135	139	173
Kansas.....	91,235	212,035	223,493	1,255,435	1,287,825	1,357,420	73	165	165
Kentucky.....	71,706	78,597	203,851	1,644,594	1,759,772	1,907,096	44	45	107
Louisiana.....	169,580	228,730	249,045	1,776,772	1,863,250	1,918,716	95	123	130
Maine.....	60,568	56,711	249,812	603,803	631,965	664,487	100	90	376
Maryland.....	5,779,695	6,730,700	8,684,796	2,497,600	2,651,542	2,682,600	2,314	2,538	3,237
Massachusetts.....	3,227,932	3,192,130	4,145,472	2,875,809	3,034,989	3,230,169	1,122	1,052	1,283
Michigan.....	876,267	707,914	975,052	4,273,741	4,658,776	4,989,288	205	152	195
Minnesota.....	456,392	679,503	781,132	2,289,419	2,499,522	2,704,989	199	272	289
Mississippi.....	255,695	250,633	394,585	1,093,688	1,180,215	1,260,277	234	212	313
Missouri.....	733,542	1,267,840	890,597	2,515,450	2,772,003	2,867,751	292	457	311
Montana.....	71,548	63,042	95,025	392,556	422,434	452,860	182	149	210
Nebraska.....	71,143	88,454	98,491	813,076	883,284	917,042	87	100	107
Nevada.....	465,781	253,235	263,897	666,348	794,455	1,016,210	699	319	260
New Hampshire.....	156,135	268,476	356,873	564,565	597,195	672,536	277	450	531
New Jersey.....	1,646,784	1,272,576	1,937,769	3,690,214	3,878,434	4,128,649	446	328	469
New Mexico.....	2,211,251	1,954,981	2,130,504	688,763	733,625	812,347	3,210	2,665	2,623
New York.....	3,058,737	2,504,851	2,927,523	7,911,253	8,075,708	8,775,663	387	310	334
North Carolina.....	700,671	821,457	1,062,536	3,334,507	3,618,202	3,995,484	210	227	266
North Dakota.....	54,230	46,178	64,051	298,437	333,616	334,773	182	138	191
Ohio.....	1,863,371	1,681,723	1,799,136	5,094,796	5,364,743	5,529,904	366	313	325
Oklahoma.....	126,054	138,258	185,121	1,433,459	1,511,991	1,601,248	88	91	116
Oregon.....	226,514	308,179	468,167	1,429,496	1,616,125	1,733,280	158	191	270
Pennsylvania.....	1,794,428	1,921,246	2,357,552	5,439,531	5,587,310	5,833,113	330	344	404
Rhode Island.....	386,339	583,158	418,037	474,214	468,284	520,809	815	1,245	803
South Carolina.....	172,130	186,659	248,988	1,682,743	1,753,247	1,900,817	102	106	131
South Dakota.....	23,886	35,041	38,803	341,854	379,898	397,873	70	92	98
Tennessee.....	666,025	558,572	734,406	2,297,758	2,602,672	2,720,964	290	215	270
Texas.....	2,872,956	3,493,457	2,671,790	8,308,202	9,129,997	9,950,535	346	383	269
Utah.....	313,996	351,719	285,968	821,434	976,817	1,105,951	382	360	259
Vermont.....	51,314	47,089	72,030	289,515	308,887	324,171	177	152	222
Virginia.....	3,231,339	4,576,317	4,842,811	3,180,803	3,241,326	3,524,677	1,016	1,412	1,374
Washington.....	900,492	1,152,903	1,329,466	2,446,615	2,691,616	2,891,456	368	428	460
West Virginia.....	166,380	254,384	235,677	686,570	744,945	765,132	242	341	308
Wisconsin.....	307,651	331,373	420,839	2,537,534	2,823,966	2,862,683	121	117	147
Wyoming.....	41,369	37,477	35,059	225,256	243,343	257,699	184	154	136
Puerto Rico.....	NA	51,614	81,016	986,778	1,112,474	1,173,795	NA	46	69

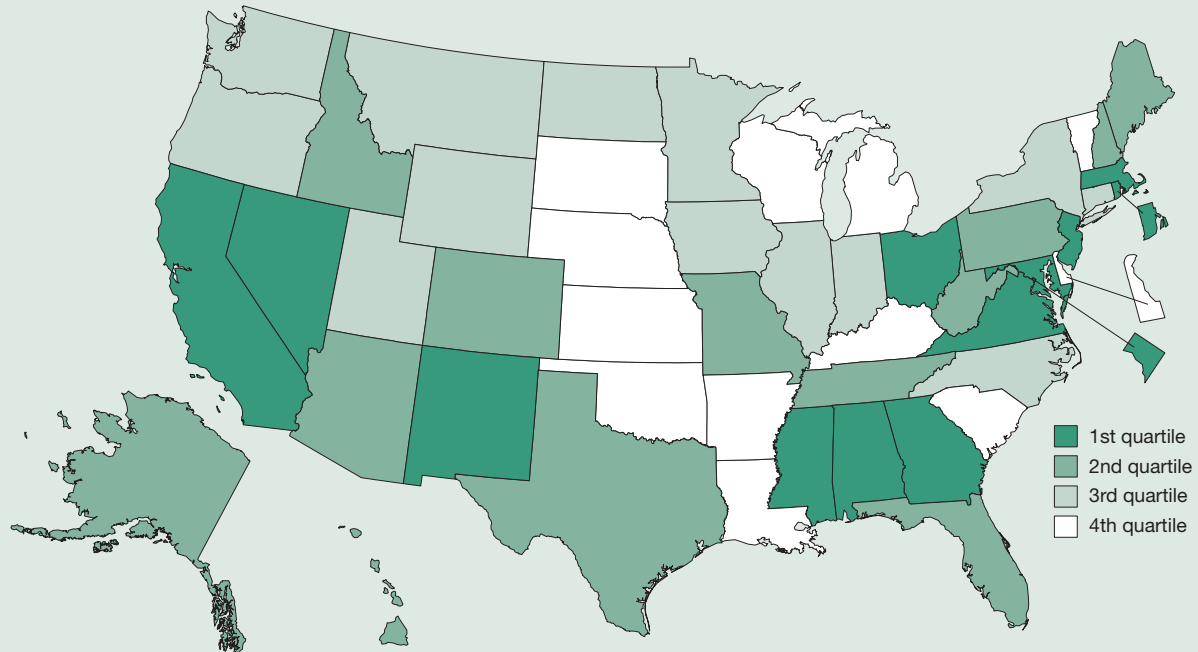
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. Only the following 10 agencies were required to report Federal R&D obligations: the Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, the Interior, and Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration; and the National Science Foundation. These obligations represent approximately 98 percent of total Federal R&D obligations in FY 1992, 1996, and 2000. Civilian workers represent the employed component of the civilian labor force and are reported as annual data, not seasonally adjusted.

SOURCES: National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development*, various years; and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics.

Federal R&D Obligations per Individual in S&E Occupation

Figure 8-14
 Quartile groups for Federal R&D obligations per individual in S&E occupation: 1999



1st quartile (\$77,756–\$21,031)	2nd quartile (\$20,053–\$12,947)	3rd quartile (\$12,874–\$7,337)	4th quartile (\$7,102–\$3,206)
Alabama	Alaska	Connecticut	Arkansas
California	Arizona	Illinois	Delaware
District of Columbia	Colorado	Indiana	Kansas
Georgia	Florida	Iowa	Kentucky
Maryland	Hawaii	Minnesota	Louisiana
Massachusetts	Idaho	Montana	Michigan
Mississippi	Maine	New York	Nebraska
Nevada	Missouri	North Carolina	Oklahoma
New Jersey	New Hampshire	North Dakota	South Carolina
New Mexico	Pennsylvania	Oregon	South Dakota
Ohio	Tennessee	Utah	Vermont
Rhode Island	Texas	Washington	Wisconsin
Virginia	West Virginia	Wyoming	

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Federal Funds for Research and Development*; and NSF/SRS, Scientists and Engineers Statistical Data System (SESTAT). See table 8-14.

This indicator demonstrates how Federal research and development obligations are distributed geographically based on individuals with a bachelor’s or higher degree who work in science and engineering occupations. These positions include mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any of these S&E fields. Positions such as managers and elementary and secondary school teachers are excluded.

Federal R&D dollars are counted where they are obligated but may be expended in many locations. Data on people in S&E occupations are sample based. For these reasons, estimates for sparsely populated states and the District of Columbia may be imprecise. A high value for this indicator may indicate the existence of major federally funded R&D facilities or the presence of large defense contractors in the state.

Findings

- The Federal Government obligated about \$66.5 billion to the states in 1995, \$68.4 billion in 1997, and \$73.6 billion in 1999 for R&D.
- The number of people in S&E occupations grew at about the same rate as the Federal R&D obligations, yielding a fairly stable amount per person during this period, about \$20,900 in 1999.
- Changes in state-by-state distribution of Federal R&D obligations resulted in significant changes in per-person funds for several states.
- A high score was evident for states in the national capital area. The state distribution on this indicator is highly skewed, with only 13 states above the national average.

Table 8-14
Federal R&D obligations per individual in S&E occupation, by state: 1995, 1997, and 1999

State	Federal R&D obligations (thousands of dollars)			Individuals in S&E occupations			Federal R&D obligations per individual in S&E occupation (dollars)		
	1995	1997	1999	1995	1997	1999	1995	1997	1999
All states.....	66,485,615	68,362,301	73,645,266	3,178,000	3,357,000	3,525,100	20,921	20,364	20,892
Alabama.....	1,931,323	2,213,683	1,806,956	40,800	44,300	43,300	47,336	49,970	41,731
Alaska.....	96,924	99,928	115,015	6,600	6,300	7,700	14,685	15,862	14,937
Arizona.....	902,338	732,065	1,116,946	47,400	54,000	55,700	19,037	13,557	20,053
Arkansas.....	97,702	95,296	106,422	14,100	15,300	16,900	6,929	6,228	6,297
California.....	12,600,156	13,730,886	15,600,123	463,900	478,000	492,000	27,161	28,726	31,708
Colorado.....	1,049,208	1,340,231	1,438,682	82,700	88,500	96,900	12,687	15,144	14,847
Connecticut.....	900,719	846,458	655,191	56,900	53,300	57,500	15,830	15,881	11,395
Delaware.....	57,746	48,964	52,255	14,300	15,700	16,300	4,038	3,119	3,206
District of Columbia.....	2,755,369	2,232,284	2,451,606	53,200	51,300	53,900	51,793	43,514	45,484
Florida.....	2,391,836	3,326,418	2,284,405	105,500	116,600	123,000	22,671	28,528	18,572
Georgia.....	4,366,021	3,919,868	2,023,240	69,800	75,600	85,900	62,550	51,850	23,553
Hawaii.....	139,291	150,722	198,808	13,100	11,500	11,700	10,633	13,106	16,992
Idaho.....	210,964	205,660	200,672	13,200	13,900	15,500	15,982	14,796	12,947
Illinois.....	1,107,430	1,140,163	1,316,085	138,300	148,600	155,200	8,007	7,673	8,480
Indiana.....	426,330	410,398	413,864	51,300	54,000	56,000	8,311	7,600	7,390
Iowa.....	212,096	228,180	264,060	22,100	24,500	23,900	9,597	9,313	11,049
Kansas.....	120,388	255,490	191,603	29,500	34,300	31,400	4,081	7,449	6,102
Kentucky.....	73,079	91,291	146,845	22,700	23,100	26,100	3,219	3,952	5,626
Louisiana.....	170,087	211,036	219,218	35,900	36,200	35,500	4,738	5,830	6,175
Maine.....	53,075	68,683	150,569	7,900	11,600	11,200	6,718	5,921	13,444
Maryland.....	7,343,723	7,328,787	8,094,369	93,300	93,900	104,100	78,711	78,049	77,756
Massachusetts.....	3,337,816	3,437,516	3,129,401	130,900	136,600	148,800	25,499	25,165	21,031
Michigan.....	683,187	735,059	839,757	116,700	122,900	131,800	5,854	5,981	6,371
Minnesota.....	570,248	609,395	885,141	69,400	76,800	81,600	8,217	7,935	10,847
Mississippi.....	209,714	289,791	351,571	15,700	14,100	16,100	13,358	20,553	21,837
Missouri.....	1,606,215	1,130,148	928,681	53,100	59,700	61,000	30,249	18,930	15,224
Montana.....	63,810	79,347	95,446	8,100	10,200	8,600	7,878	7,779	11,098
Nebraska.....	84,680	82,981	94,089	15,300	15,200	19,900	5,535	5,459	4,728
Nevada.....	368,914	295,042	279,129	11,600	10,100	10,800	31,803	29,212	25,845
New Hampshire.....	213,243	278,697	291,723	14,000	17,000	19,100	15,232	16,394	15,273
New Jersey.....	1,297,664	1,318,793	2,661,153	118,900	118,500	121,200	10,914	11,129	21,957
New Mexico.....	1,959,948	1,933,123	2,068,291	25,100	25,900	28,600	78,086	74,638	72,318
New York.....	2,585,904	2,471,013	2,689,016	197,400	206,900	216,000	13,100	11,943	12,449
North Carolina.....	831,620	900,344	1,007,518	75,000	84,500	93,800	11,088	10,655	10,741
North Dakota.....	47,359	53,015	59,947	4,500	4,300	4,700	10,524	12,329	12,755
Ohio.....	1,809,958	1,879,784	3,687,855	119,900	138,600	132,900	15,096	13,563	27,749
Oklahoma.....	158,691	160,356	165,818	25,500	28,600	28,100	6,223	5,607	5,901
Oregon.....	283,411	319,587	408,099	37,800	39,800	43,400	7,498	8,030	9,403
Pennsylvania.....	2,394,246	1,893,723	1,907,139	137,700	141,800	143,300	17,387	13,355	13,309
Rhode Island.....	514,632	403,844	391,717	15,600	13,500	14,200	32,989	29,914	27,586
South Carolina.....	173,217	166,607	215,941	31,800	34,200	37,500	5,447	4,872	5,758
South Dakota.....	26,501	41,955	38,951	5,400	5,400	7,000	4,908	7,769	5,564
Tennessee.....	582,499	566,242	684,712	50,400	47,100	44,400	11,558	12,022	15,421
Texas.....	4,068,928	3,640,162	3,853,339	229,600	232,300	254,800	17,722	15,670	15,123
Utah.....	368,829	319,851	305,019	26,100	24,400	25,200	14,131	13,109	12,104
Vermont.....	52,950	49,885	61,707	8,800	10,200	12,500	6,017	4,891	4,937
Virginia.....	3,392,184	4,849,753	5,750,372	104,500	116,200	124,100	32,461	41,736	46,337
Washington.....	1,131,625	1,226,154	1,306,757	75,800	97,900	101,500	14,929	12,525	12,874
West Virginia.....	287,939	193,061	227,023	12,000	14,100	16,500	23,995	13,692	13,759
Wisconsin.....	338,475	332,214	377,801	52,500	54,000	53,200	6,447	6,152	7,102
Wyoming.....	35,403	28,368	35,219	6,400	5,700	4,800	5,532	4,977	7,337
Puerto Rico.....	46,695	58,943	72,709	NA	NA	NA	NA	NA	NA

NA not available

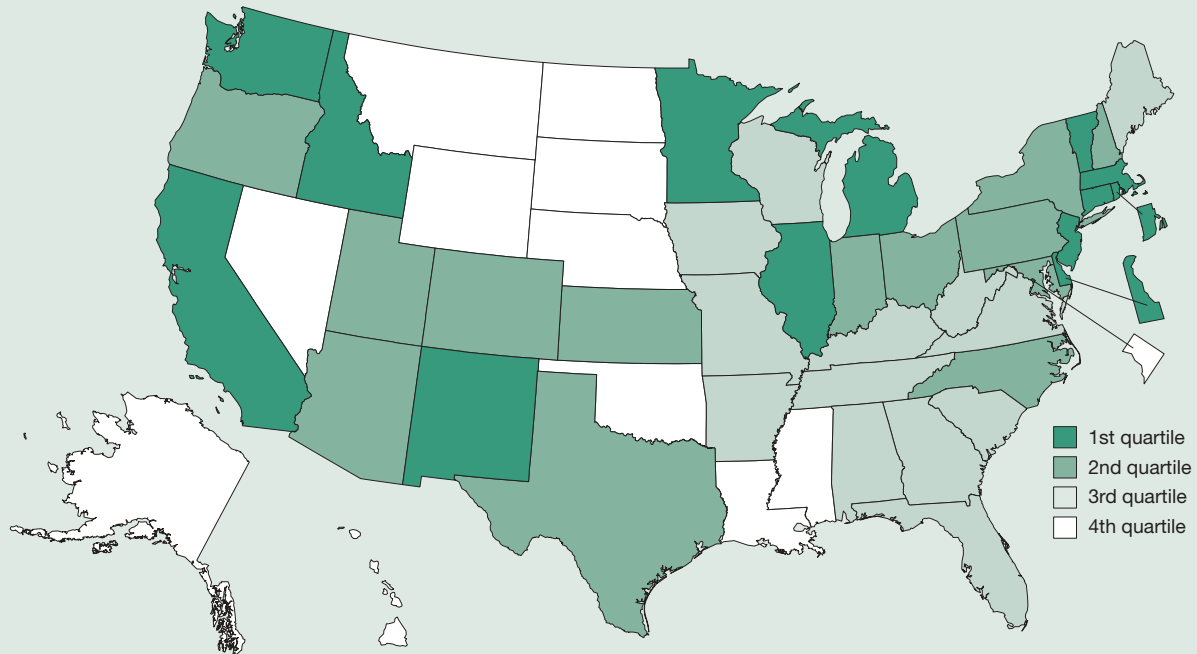
NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. Only the following 10 agencies were required to report Federal R&D obligations: the Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, the Interior, and Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration; and the National Science Foundation. These obligations represent approximately 98 percent of Federal R&D obligations in FY 1995, 1997, and 1999. People in S&E occupations include those who are employed in S&E at the time of survey and are included in one of the following groups: (1) have ever received a bachelor's degree or higher in an S&E field or (2) have a non-S&E bachelor's or higher degree and were in an S&E occupation at the time of the 1993 Scientists and Engineers Statistical Data System (SESTAT) survey. S&E occupations include mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any S&E degree field. Because SESTAT survey sample designs do not include geography, reliability of estimates in some states may be poor because of small sample size.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Federal Funds for Research and Development*, various years; and NSF/SRS, SESTAT.

Industry-Performed R&D as Share of Private-Industry Output

Figure 8-15

Quartile groups for industry-performed R&D as share of private-industry output: 2000



1st quartile (6.08–2.23 percent)	2nd quartile (2.18–1.33 percent)	3rd quartile (1.29–0.47 percent)	4th quartile (0.44–0.04 percent)
California	Arizona	Alabama	Alaska
Connecticut	Colorado	Arkansas	District of Columbia
Delaware	Indiana	Florida	Hawaii
Idaho	Kansas	Georgia	Louisiana
Illinois	Maryland	Iowa	Mississippi
Massachusetts	New Hampshire	Kentucky	Montana
Michigan	New York	Maine	Nebraska
Minnesota	North Carolina	Missouri	Nevada
New Jersey	Ohio	South Carolina	North Dakota
New Mexico	Oregon	Tennessee	Oklahoma
Rhode Island	Pennsylvania	Virginia	South Dakota
Vermont	Texas	West Virginia	Wyoming
Washington	Utah	Wisconsin	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development; U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data; and European Commission, *Third European Report on Science & Technology Indicators*, 2003. See table 8-15.

This indicator measures the emphasis that private industry places on research and development. Industrial R&D focuses on projects that are expected to yield new or improved products, processes, or services and thus bring direct benefits to the company.

Differences among states on this indicator should be interpreted with

caution. Because industries differ in reliance on R&D, the indicator reflects state differences in industrial structure as much as the behavior of individual companies. Furthermore, industrial R&D data for states with small economies may have high imputation rates and imprecise estimates.

Findings

- The state total of industry-performed R&D reached \$187.5 billion in 2000, up from \$117.0 billion in 1991.
- Throughout the period, U.S. private industry devoted 2.0–2.3 percent of its output to R&D.
- Broadly comparable figures for the European Union (1999) and Japan (1998), as reported by the European Commission, were 1.4 and 2.5 percent, respectively.
- A wide margin between top and bottom quartiles marks this indicator. Large differences among states may reflect differences in industry structure or in R&D intensities of individual firms, whereas major shifts within a state over the decade probably reflect the behavior of large firms in the state.

Table 8-15
Industry-performed R&D as share of private-industry output, by state: 1991, 1995, and 2000

State	Industry-performed R&D (millions of dollars)			Private-industry output (millions of dollars)			Industry-performed R&D/ private-industry output (percent)		
	1991	1995	2000	1991	1995	2000	1991	1995	2000
All states.....	116,952	130,332	187,544	5,109,484	6,384,551	8,735,491	2.29	2.04	2.15
Alabama.....	596	686	607	62,731	80,215	100,871	0.95	0.86	0.60
Alaska.....	21	30	9	17,486	19,865	22,844	0.12	0.15	0.04
Arizona.....	1,080	1,356	2,445	60,672	90,743	135,241	1.78	1.49	1.81
Arkansas.....	NA	181	273	35,790	47,231	58,328	NA	0.38	0.47
California.....	NA	28,710	45,769	713,723	812,793	1,188,938	NA	3.53	3.85
Colorado.....	NA	1,865	3,140	66,880	93,797	149,983	NA	1.99	2.09
Connecticut.....	1,756	3,906	4,371	90,759	107,670	148,401	1.93	3.63	2.95
Delaware.....	NA	1,077	1,444	20,043	24,965	33,884	NA	4.31	4.26
District of Columbia.....	46	672	112	25,118	28,710	38,387	0.18	2.34	0.29
Florida.....	NA	4,101	3,212	231,125	300,056	413,952	NA	1.37	0.78
Georgia.....	993	1,175	1,579	127,028	176,858	260,526	0.78	0.66	0.61
Hawaii.....	13	14	44	26,932	29,278	33,500	0.05	0.05	0.13
Idaho.....	NA	827	1,338	15,786	23,534	31,882	NA	3.51	4.20
Illinois.....	5,750	5,776	10,661	255,321	322,813	419,836	2.25	1.79	2.54
Indiana.....	2,274	2,721	2,668	101,138	133,109	170,420	2.25	2.04	1.57
Iowa.....	527	998	538	50,523	63,121	78,878	1.04	1.58	0.68
Kansas.....	NA	569	1,140	45,952	54,563	73,084	NA	1.04	1.56
Kentucky.....	176	452	582	60,319	78,522	101,566	0.29	0.58	0.57
Louisiana.....	NA	61	126	84,430	98,689	128,381	NA	0.06	0.10
Maine.....	NA	286	201	19,833	23,958	31,175	NA	1.19	0.64
Maryland.....	1,376	1,075	2,032	95,836	114,084	152,905	1.44	0.94	1.33
Massachusetts.....	NA	7,416	9,863	144,891	177,676	258,215	NA	4.17	3.82
Michigan.....	9,283	12,388	17,640	170,319	226,269	290,273	5.45	5.47	6.08
Minnesota.....	2,070	2,636	3,722	91,529	117,004	167,043	2.26	2.25	2.23
Mississippi.....	NA	66	101	34,614	46,189	55,156	NA	0.14	0.18
Missouri.....	NA	2,028	1,893	97,151	123,851	156,394	NA	1.64	1.21
Montana.....	NA	17	28	11,631	14,673	18,072	NA	0.12	0.15
Nebraska.....	67	150	199	29,792	37,499	47,880	0.23	0.40	0.42
Nevada.....	95	322	248	29,645	44,133	67,778	0.32	0.73	0.37
New Hampshire.....	NA	472	586	22,434	29,459	43,729	NA	1.60	1.34
New Jersey.....	8,933	8,200	12,062	199,895	242,564	322,959	4.47	3.38	3.73
New Mexico.....	1,217	1,461	1,158	24,779	34,679	43,493	4.91	4.21	2.66
New York.....	9,457	8,651	10,539	445,505	530,410	718,871	2.12	1.63	1.47
North Carolina.....	1,470	2,226	3,672	127,213	168,801	238,869	1.16	1.32	1.54
North Dakota.....	NA	12	51	9,551	12,155	15,851	NA	0.10	0.32
Ohio.....	5,406	4,001	5,962	208,508	262,644	329,722	2.59	1.52	1.81
Oklahoma.....	448	288	333	49,628	58,256	76,199	0.90	0.49	0.44
Oregon.....	NA	741	1,651	52,266	71,012	107,644	NA	1.04	1.53
Pennsylvania.....	NA	5,331	7,873	231,389	284,861	360,516	NA	1.87	2.18
Rhode Island.....	174	520	1,090	19,018	22,454	31,889	0.91	2.32	3.42
South Carolina.....	479	739	781	56,598	73,868	94,795	0.85	1.00	0.82
South Dakota.....	6	19	44	11,983	15,825	20,467	0.05	0.12	0.21
Tennessee.....	843	1,003	1,215	88,286	120,411	156,817	0.95	0.83	0.77
Texas.....	5,439	6,211	8,961	353,185	451,194	656,638	1.54	1.38	1.36
Utah.....	407	803	979	27,647	39,006	58,765	1.47	2.06	1.67
Vermont.....	NA	248	396	10,322	12,223	15,798	NA	2.03	2.51
Virginia.....	1,275	1,577	2,718	121,399	152,134	214,822	1.05	1.04	1.27
Washington.....	3,677	4,294	9,265	103,317	128,455	189,418	3.56	3.34	4.89
West Virginia.....	NA	243	235	25,191	31,175	34,133	NA	0.78	0.69
Wisconsin.....	1,304	1,706	1,981	92,687	118,355	153,785	1.41	1.44	1.29
Wyoming.....	2	25	7	11,686	12,742	16,518	0.02	0.20	0.04
Puerto Rico.....	NA	NA	NA	NA	NA	NA	NA	NA	NA

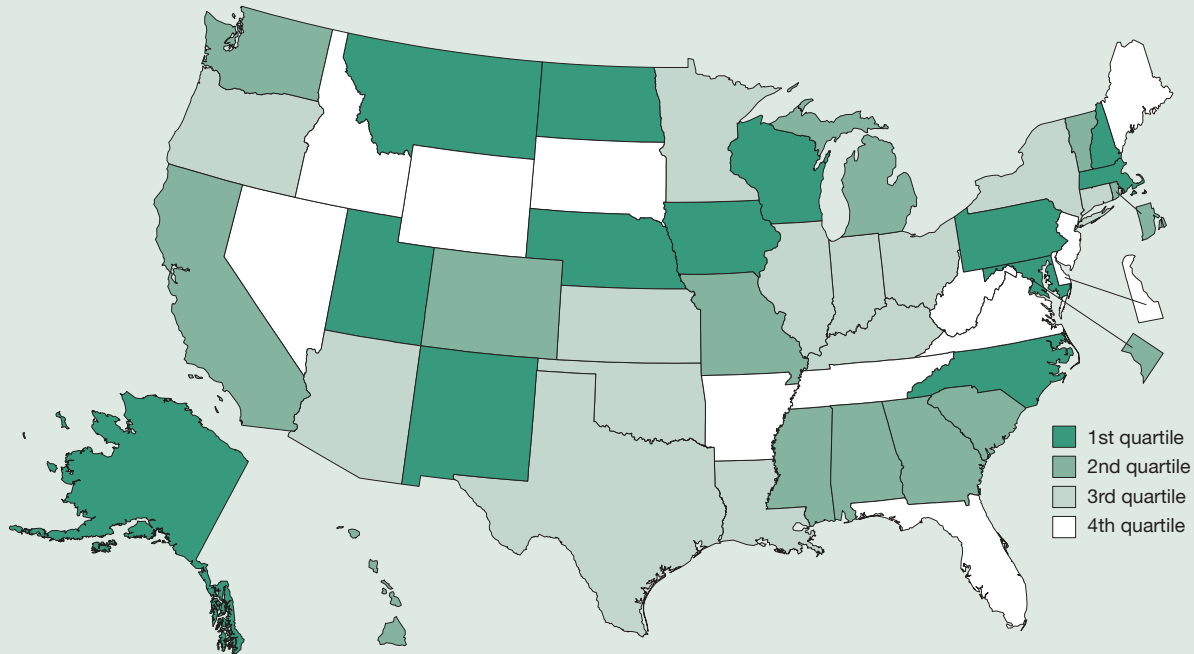
NA not available

NOTES: The state total for industry-performed R&D in 1991 is based on the the reported value for the United States in the Survey of Industrial Research and Development: 2000, table A-30. The state total for industry-performed R&D in 1995 and 2000 is based on the sum of the 50 states and the District of Columbia. 1991 industry-performed R&D for Arkansas, California, Colorado, Florida, Idaho, Kansas, Louisiana, Maine, Massachusetts, Mississippi, Missouri, Montana, North Dakota, Oregon, and Pennsylvania have imputations of more than 50 percent and have been withheld. 1991 industry-performed R&D for Delaware, New Hampshire, Vermont, and West Virginia have been withheld to avoid disclosing information about individual companies. 1995 industry-performed R&D for Arizona, Delaware, District of Columbia, Illinois, Indiana, Minnesota, Missouri, Texas, and Washington have imputations of more than 50 percent. 2000 industry-performed R&D for Alaska, Connecticut, Delaware, Indiana, Kansas, Michigan, Minnesota, Montana, New Mexico, North Dakota, Rhode Island, Tennessee, and Washington have imputations of more than 50 percent. The state total for private-industry output for each year is the sum of the 50 states and the District of Columbia. Private-industry output is reported in current dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development; and U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data.

Academic R&D per \$1,000 of Gross State Product

Figure 8-16
 Quartile groups for academic R&D per \$1,000 GSP: 2001



1st quartile (\$5.96–\$4.04)	2nd quartile (\$4.01–\$3.14)	3rd quartile (\$3.12–\$2.47)	4th quartile (\$2.32–\$1.33)
Alaska	Alabama	Arizona	Arkansas
Iowa	California	Connecticut	Delaware
Maryland	Colorado	Illinois	Florida
Massachusetts	District of Columbia	Indiana	Idaho
Montana	Georgia	Kansas	Maine
Nebraska	Hawaii	Kentucky	Nevada
New Hampshire	Michigan	Louisiana	New Jersey
New Mexico	Mississippi	Minnesota	South Dakota
North Carolina	Missouri	New York	Tennessee
North Dakota	Rhode Island	Ohio	Virginia
Pennsylvania	South Carolina	Oklahoma	West Virginia
Utah	Vermont	Oregon	Wyoming
Wisconsin	Washington	Texas	

SOURCES: National Science Foundation, Division of Science Resources Statistics, *Academic Research and Development Expenditures*; and U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data. See table 8-16.

This indicator measures the extent of spending on academic research performed in a state relative to the size of that state’s economy. Academic research and development is more basic and less product oriented than R&D performed by industry. It can be a valuable precursor to future economic

development. High values on this indicator may reflect an academic R&D system that can compete for funding from Federal, state, and industrial sources. In this indicator, Maryland data exclude expenditures by the Applied Physics Laboratory at the Johns Hopkins University.

Findings

- The states’ academic R&D expenditures grew from \$16.9 billion in 1991 to \$32.2 billion in 2001.
- In 2001, academic-performed R&D accounted for 12.1 percent of R&D performed in the states.
- Although the average value of this indicator rose approximately 11 percent during the past decade, some states showed sizable increases or decreases during this period.

Table 8-16
Academic R&D per \$1,000 GSP, by state: 1991, 1996 and 2001

State	Academic R&D (thousands of dollars)			GSP (millions of dollars)			Academic R&D/\$1,000 GSP		
	1991	1996	2001	1991	1996	2001	1991	1996	2001
All states.....	16,863,363	22,136,530	32,170,317	5,895,431	7,715,898	10,137,194	2.86	2.87	3.17
Alabama.....	252,998	342,021	445,299	75,977	99,286	121,490	3.33	3.44	3.67
Alaska.....	67,432	71,381	115,601	22,021	25,774	28,581	3.06	2.77	4.04
Arizona.....	284,128	375,881	500,548	71,876	112,882	160,687	3.95	3.33	3.12
Arkansas.....	55,081	94,006	140,741	41,277	56,796	67,913	1.33	1.66	2.07
California.....	2,146,736	2,817,913	4,422,032	814,743	973,395	1,359,265	2.63	2.89	3.25
Colorado.....	260,587	406,203	572,950	79,448	117,118	173,772	3.28	3.47	3.30
Connecticut.....	320,935	388,134	498,745	100,395	124,157	166,165	3.20	3.13	3.00
Delaware.....	44,696	54,154	79,985	22,169	29,001	40,509	2.02	1.87	1.97
District of Columbia.....	118,398	201,445	228,110	42,240	48,505	64,459	2.80	4.15	3.54
Florida.....	438,054	638,102	997,048	269,845	366,318	491,488	1.62	1.74	2.03
Georgia.....	484,019	712,188	988,883	148,722	219,520	299,874	3.25	3.24	3.30
Hawaii.....	78,166	111,202	156,976	34,002	37,490	43,710	2.30	2.97	3.59
Idaho.....	41,437	64,930	82,496	18,655	28,101	36,905	2.22	2.31	2.24
Illinois.....	697,565	862,321	1,280,807	285,719	375,949	475,541	2.44	2.29	2.69
Indiana.....	262,508	389,982	584,418	114,188	155,096	189,919	2.30	2.51	3.08
Iowa.....	259,437	332,402	439,810	57,698	76,976	90,942	4.50	4.32	4.84
Kansas.....	124,174	181,775	268,800	53,576	68,160	87,196	2.32	2.67	3.08
Kentucky.....	97,989	148,376	296,895	70,834	95,536	120,266	1.38	1.55	2.47
Louisiana.....	235,726	307,839	432,356	95,918	116,867	148,697	2.46	2.63	2.91
Maine.....	27,082	34,684	68,034	23,635	28,925	37,449	1.15	1.20	1.82
Maryland.....	626,903	801,338	1,162,523	117,630	145,061	195,007	5.33	5.52	5.96
Massachusetts.....	953,708	1,178,562	1,576,517	161,517	210,127	287,802	5.90	5.61	5.48
Michigan.....	601,189	807,900	1,107,195	194,230	265,130	320,470	3.10	3.05	3.45
Minnesota.....	331,471	341,468	469,208	103,923	141,540	188,050	3.19	2.41	2.50
Mississippi.....	100,383	124,675	242,133	41,311	56,575	67,125	2.43	2.20	3.61
Missouri.....	305,780	404,875	678,460	110,396	146,537	181,493	2.77	2.76	3.74
Montana.....	38,149	71,518	107,744	14,075	18,074	22,635	2.71	3.96	4.76
Nebraska.....	125,065	158,398	241,638	35,482	47,772	56,967	3.52	3.32	4.24
Nevada.....	66,742	84,970	115,934	33,665	54,564	79,220	1.98	1.56	1.46
New Hampshire.....	78,975	98,638	196,975	24,948	35,068	47,183	3.17	2.81	4.17
New Jersey.....	352,310	452,917	609,470	224,307	285,738	365,388	1.57	1.59	1.67
New Mexico.....	170,139	213,691	274,209	30,862	44,114	55,426	5.51	4.84	4.95
New York.....	1,427,840	1,732,340	2,476,090	504,665	633,830	826,488	2.83	2.73	3.00
North Carolina.....	501,841	741,679	1,137,279	147,473	204,329	275,615	3.40	3.63	4.13
North Dakota.....	48,930	71,849	84,574	11,634	15,855	19,005	4.21	4.53	4.45
Ohio.....	503,725	693,786	995,972	235,876	306,333	373,708	2.14	2.26	2.67
Oklahoma.....	152,624	201,626	255,217	59,698	74,855	93,855	2.56	2.69	2.72
Oregon.....	179,384	276,109	366,023	60,602	91,709	120,055	2.96	3.01	3.05
Pennsylvania.....	878,826	1,189,746	1,687,457	260,591	329,660	408,373	3.37	3.61	4.13
Rhode Island.....	88,448	107,266	142,564	21,758	26,656	36,939	4.07	4.02	3.86
South Carolina.....	151,204	217,881	361,404	68,776	89,854	115,204	2.20	2.42	3.14
South Dakota.....	15,959	25,440	32,185	14,093	19,372	24,251	1.13	1.31	1.33
Tennessee.....	243,763	317,090	423,264	102,049	142,051	182,515	2.39	2.23	2.32
Texas.....	1,220,313	1,527,990	2,244,117	403,286	553,180	763,874	3.03	2.76	2.94
Utah.....	201,470	207,923	338,127	33,658	51,523	70,409	5.99	4.04	4.80
Vermont.....	46,541	53,659	76,882	11,771	14,662	19,149	3.95	3.66	4.01
Virginia.....	343,464	411,825	610,717	153,965	199,953	273,070	2.23	2.06	2.24
Washington.....	349,667	505,113	706,579	122,453	161,779	222,950	2.86	3.12	3.17
West Virginia.....	50,772	55,206	79,076	29,331	37,220	42,368	1.73	1.48	1.87
Wisconsin.....	387,621	485,560	728,618	104,918	141,046	177,354	3.69	3.44	4.11
Wyoming.....	23,009	40,553	41,632	13,550	15,879	20,418	1.70	2.55	2.04
Puerto Rico.....	NA	NA	63,755	22,809	30,357	NA	NA	NA	NA

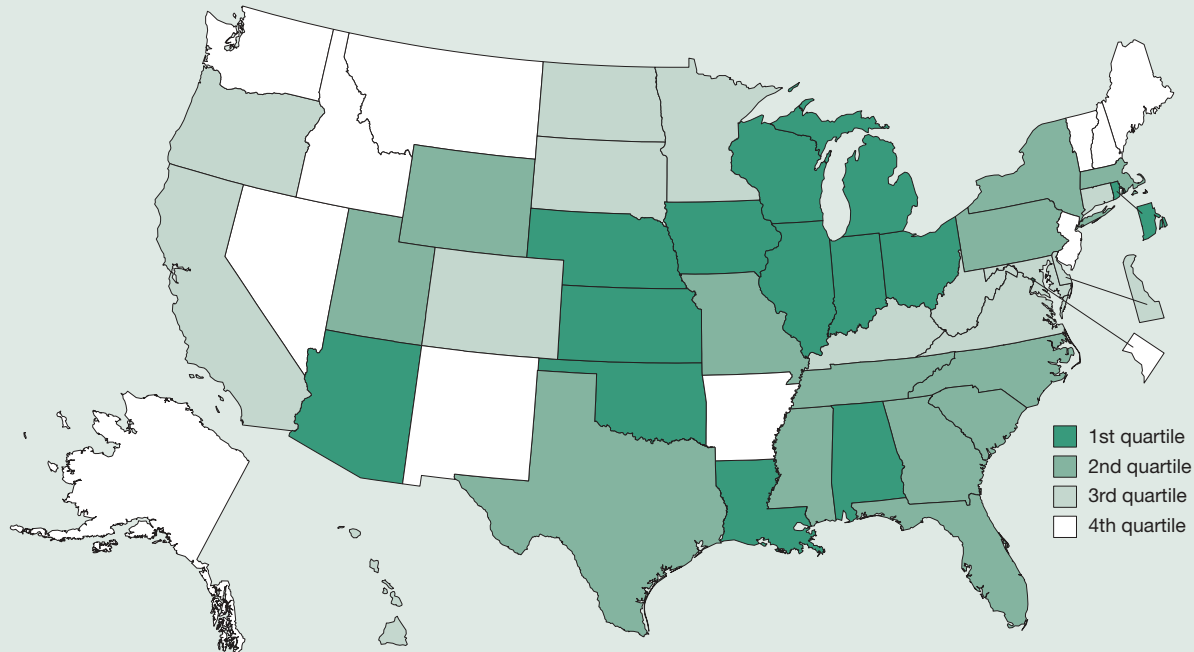
GSP gross state product
 NA not available

NOTES: The state total for academic R&D for each year is the sum of the 50 states and the District of Columbia. In 2001, academic R&D was reported for all institutions. In 1991 and 1996, it was reported for doctorate-granting institutions only. For Maryland, academic R&D excludes R&D performed by the Applied Physics Laboratory at the Johns Hopkins University. GSP is reported in current dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics, *Academic Research and Development Expenditures*, various years; U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data; and Government of Puerto Rico, Office of the Governor.

S&E Doctorates Conferred per 1,000 S&E Doctorate Holders

Figure 8-17
 Quartile groups for S&E doctorates conferred per 1,000 S&E doctorate holders: 2001



1st quartile (92.3–55.2)	2nd quartile (53.9–44.8)	3rd quartile (44.5–34.0)	4th quartile (33.7–15.6)
Alabama	Florida	California	Alaska
Arizona	Georgia	Colorado	Arkansas
Illinois	Massachusetts	Connecticut	District of Columbia
Indiana	Mississippi	Delaware	Idaho
Iowa	Missouri	Hawaii	Maine
Kansas	New York	Kentucky	Montana
Louisiana	North Carolina	Maryland	Nevada
Michigan	Pennsylvania	Minnesota	New Hampshire
Nebraska	South Carolina	North Dakota	New Jersey
Ohio	Tennessee	Oregon	New Mexico
Oklahoma	Texas	South Dakota	Vermont
Rhode Island	Utah	Virginia	Washington
Wisconsin	Wyoming	West Virginia	

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Survey of Earned Doctorates; and NSF/SRS, Survey of Doctorate Recipients. See table 8-17.

This indicator is a measure of the rate at which the states are training new science and engineering doctorate recipients for entry into the workforce. High values indicate relatively large production of new doctorate holders compared with the existing stock. Some states with relatively low values may need to attract S&E

doctorate holders from elsewhere to meet the needs of local employers.

U.S. S&E doctorate holders include those in physical, earth, atmospheric, ocean, life, computer, and social sciences; mathematics; engineering; and psychology. Medical doctorates are excluded.

Findings

- In 2001, 27,000 S&E doctoral degrees were awarded by U.S. academic institutions, which was essentially the same as in 1993.
- The state average of this indicator decreased between 1993 and 2001, reflecting an increase in the stock of S&E doctorate holders in the United States.
- This indicator is volatile for many states, which may reflect the migration patterns of existing S&E doctorate holders.

Table 8-17
S&E doctorates conferred per 1,000 S&E doctorate holders, by state: 1993, 1997 and 2001

State	S&E doctorates conferred			U.S. S&E doctorate holders			S&E doctorates conferred per 1,000 U.S. S&E doctorate holders		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
All states.....	26,614	28,579	27,025	461,210	516,580	572,820	57.7	55.3	47.2
Alabama.....	276	369	320	5,020	6,610	5,330	55.0	55.8	60.0
Alaska.....	10	20	26	1,050	1,110	1,200	9.5	18.0	21.7
Arizona.....	428	497	419	5,040	6,280	7,070	84.9	79.1	59.3
Arkansas.....	61	70	69	1,770	2,320	2,560	34.5	30.2	27.0
California.....	3,600	3,604	3,550	60,490	70,490	80,870	59.5	51.1	43.9
Colorado.....	527	597	519	8,890	10,740	11,780	59.3	55.6	44.1
Connecticut.....	411	409	387	7,510	8,770	9,490	54.7	46.6	40.8
Delaware.....	123	131	128	3,500	3,710	3,540	35.1	35.3	36.2
District of Columbia.....	342	331	302	13,510	11,800	14,200	25.3	28.1	21.3
Florida.....	642	862	848	11,770	13,330	15,740	54.5	64.7	53.9
Georgia.....	488	583	644	8,130	9,880	11,990	60.0	59.0	53.7
Hawaii.....	133	134	111	2,360	2,550	2,580	56.4	52.5	43.0
Idaho.....	48	60	54	1,860	2,030	2,230	25.8	29.6	24.2
Illinois.....	1,451	1,447	1,388	19,160	21,260	22,110	75.7	68.1	62.8
Indiana.....	722	727	699	7,610	7,570	9,580	94.9	96.0	73.0
Iowa.....	457	437	405	3,790	4,120	4,390	120.6	106.1	92.3
Kansas.....	246	297	286	3,290	3,770	3,970	74.8	78.8	72.0
Kentucky.....	173	225	183	3,570	4,110	4,590	48.5	54.7	39.9
Louisiana.....	270	362	368	5,230	5,360	5,290	51.6	67.5	69.6
Maine.....	30	41	31	1,830	2,150	1,990	16.4	19.1	15.6
Maryland.....	715	786	774	18,390	21,020	22,730	38.9	37.4	34.1
Massachusetts.....	1,545	1,575	1,547	21,360	23,330	29,100	72.3	67.5	53.2
Michigan.....	990	1,035	960	13,020	15,060	17,380	76.0	68.7	55.2
Minnesota.....	487	531	508	8,030	9,810	11,410	60.6	54.1	44.5
Mississippi.....	128	158	142	2,750	3,000	3,170	46.5	52.7	44.8
Missouri.....	389	497	465	7,970	9,490	9,280	48.8	52.4	50.1
Montana.....	46	59	42	1,460	1,690	1,440	31.5	34.9	29.2
Nebraska.....	135	193	171	2,380	3,010	2,890	56.7	64.1	59.2
Nevada.....	24	49	54	1,380	1,620	2,030	17.4	30.2	26.6
New Hampshire.....	99	95	79	1,990	2,230	2,470	49.7	42.6	32.0
New Jersey.....	555	630	636	19,320	20,440	22,740	28.7	30.8	28.0
New Mexico.....	178	165	153	6,320	7,480	7,750	28.2	22.1	19.7
New York.....	2,604	2,434	2,224	39,110	40,080	43,990	66.6	60.7	50.6
North Carolina.....	706	777	771	12,220	13,730	16,760	57.8	56.6	46.0
North Dakota.....	54	52	43	1,200	1,350	1,080	45.0	38.5	39.8
Ohio.....	1,043	1,295	1,139	16,700	18,700	20,070	62.5	69.3	56.8
Oklahoma.....	220	244	241	4,410	4,580	4,360	49.9	53.3	55.3
Oregon.....	322	317	274	5,600	6,210	7,040	57.5	51.0	38.9
Pennsylvania.....	1,365	1,448	1,354	21,990	23,940	26,140	62.1	60.5	51.8
Rhode Island.....	217	165	168	2,060	2,450	2,640	105.3	67.3	63.6
South Carolina.....	240	251	249	4,310	4,780	5,130	55.7	52.5	48.5
South Dakota.....	20	37	34	930	1,060	1,000	21.5	34.9	34.0
Tennessee.....	350	423	404	7,660	8,520	8,990	45.7	49.6	44.9
Texas.....	1,599	1,749	1,720	25,880	28,570	32,490	61.8	61.2	52.9
Utah.....	283	296	259	3,720	4,800	4,820	76.1	61.7	53.7
Vermont.....	47	35	52	1,500	1,760	1,750	31.3	19.9	29.7
Virginia.....	681	710	667	13,710	15,250	17,460	49.7	46.6	38.2
Washington.....	444	514	497	10,570	13,360	14,760	42.0	38.5	33.7
West Virginia.....	67	82	68	1,760	1,890	1,890	38.1	41.4	36.0
Wisconsin.....	585	708	555	7,410	8,460	8,720	78.9	83.7	63.6
Wyoming.....	38	66	38	720	860	840	52.8	76.7	45.2
Puerto Rico.....	26	84	97	NA	NA	NA	NA	NA	NA

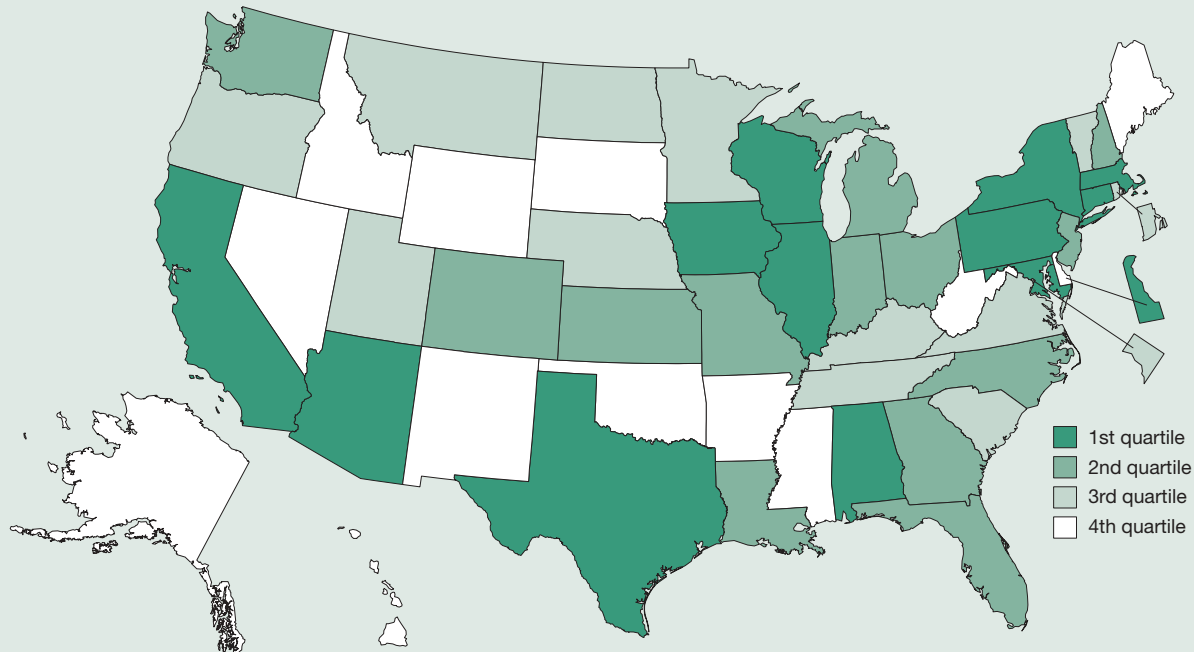
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. The Survey of Doctorate Recipients sample design does not include geography. Data on U.S. S&E doctorate holders are classified by employment location and workforce data based on respondents' residence. Thus, the reliability of data for areas with smaller populations is lower than for more populous states. The reliability of estimates for the 1993 U.S. S&E doctorate holders for Alaska, North Dakota, South Dakota, and Wyoming may be poor because of small sample size. The reliability of estimates for the 1997 U.S. S&E doctorate holders for Alaska, Montana, Nevada, North Dakota, South Dakota, Vermont, West Virginia, and Wyoming may be poor because of small sample size. The reliability of estimates for the 2001 holders of a U.S. S&E doctorate for Alaska, Montana, North Dakota, South Dakota, Vermont, West Virginia, and Wyoming may be poor because of small sample size.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Survey of Earned Doctorates; and NSF/SRS, Survey of Doctorate Recipients.

Academic Article Output per 1,000 S&E Doctorate Holders in Academia

Figure 8-18
 Quartile groups for article output per 1,000 S&E doctorate holders in academia: 2001



1st quartile (889–632)	2nd quartile (604–540)	3rd quartile (525–406)	4th quartile (385–195)
Alabama	Colorado	District of Columbia	Alaska
Arizona	Florida	Kentucky	Arkansas
California	Georgia	Minnesota	Hawaii
Connecticut	Indiana	Montana	Idaho
Delaware	Kansas	Nebraska	Maine
Illinois	Louisiana	North Dakota	Mississippi
Iowa	Michigan	Oregon	Nevada
Maryland	Missouri	Rhode Island	New Mexico
Massachusetts	New Hampshire	South Carolina	Oklahoma
New York	New Jersey	Tennessee	South Dakota
Pennsylvania	North Carolina	Utah	West Virginia
Texas	Ohio	Vermont	Wyoming
Wisconsin	Washington	Virginia	

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients. See table 8-18.

The volume of peer-reviewed articles per 1,000 academic science and engineering doctorate holders is an approximate measure of their contribution to scientific knowledge. Publications are only one measure of academic productivity, which includes trained personnel, patents, and other outputs. A high value on this indicator shows that the S&E faculty in a state’s academic institutions are generating a high volume of publications relative to other states.

Publication counts are based on the number of articles appearing in a set of journals listed in the Institute for Scientific Information’s Science Citation Index and Social Sciences Citation Index. The number of journals was 4,601 in 1993, 5,029 in 1997, and 5,262 in 2001. Articles with authors in different institutions were counted fractionally. For a publication with N authors, each author’s institution was credited with 1/N articles.

Findings

- The state average of this indicator declined between 1993 and 2001.
- During this period, the number of scientific and technical articles remained fairly constant at 140,000–150,000, whereas the number of S&E doctorate holders employed in academia rose from 210,000 to 245,000.
- The indicator values of many states were volatile between 1993 and 2001.
- In 2001, the states with the highest values for this indicator were spread across the nation.

Table 8-18

Academic article output per 1,000 S&E doctorate holders in academia, by state: 1993, 1997, and 2001

State	Academic article output			S&E doctorate holders in academia			Academic article output per 1,000 S&E doctorate holders in academia		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
All states.....	142,023	144,404	147,561	209,070	232,100	243,890	679	622	605
Alabama	1,787	1,911	1,896	3,010	4,480	3,000	594	426	632
Alaska.....	169	163	186	530	430	530	318	380	351
Arizona.....	2,249	2,256	2,199	2,540	2,740	2,950	885	823	746
Arkansas.....	562	603	608	1,210	1,490	1,580	464	405	385
California.....	18,010	17,530	18,148	21,330	23,970	24,090	844	731	753
Colorado.....	2,355	2,523	2,630	3,580	4,400	4,830	658	573	544
Connecticut.....	2,723	2,820	2,767	3,540	3,830	4,120	769	736	672
Delaware.....	530	499	560	650	710	760	815	703	737
District of Columbia.....	1,187	1,224	1,213	2,010	2,180	2,720	590	562	446
Florida.....	4,146	4,187	4,256	5,720	6,110	7,230	725	685	589
Georgia.....	2,880	3,255	3,578	4,050	5,260	5,970	711	619	599
Hawaii.....	585	574	538	1,340	1,240	1,440	437	463	374
Idaho.....	297	295	309	810	750	890	367	393	347
Illinois.....	7,100	6,894	7,012	9,650	10,080	10,320	736	684	679
Indiana.....	3,077	3,104	3,096	4,460	4,560	5,620	690	681	551
Iowa.....	2,292	2,272	2,226	2,940	3,090	3,220	779	735	691
Kansas.....	1,244	1,199	1,251	2,050	2,230	2,180	607	538	574
Kentucky.....	1,310	1,381	1,355	2,500	2,920	3,190	524	473	425
Louisiana.....	1,787	1,895	1,828	3,230	3,420	3,290	553	554	556
Maine.....	245	247	234	1,190	1,310	1,200	206	189	195
Maryland.....	4,237	4,319	4,851	4,520	5,820	5,460	937	742	889
Massachusetts.....	8,630	9,238	9,680	10,930	11,500	12,880	790	803	752
Michigan.....	4,892	4,880	5,078	7,000	7,690	8,520	699	635	596
Minnesota.....	2,493	2,435	2,389	3,890	4,300	5,140	641	566	465
Mississippi.....	507	628	692	1,840	1,890	1,890	275	332	366
Missouri.....	2,946	3,163	3,230	4,360	5,480	5,360	676	577	603
Montana.....	265	272	328	880	1,020	810	301	267	406
Nebraska.....	1,067	1,030	1,011	1,770	2,310	1,940	603	446	521
Nevada.....	375	370	447	770	960	1,180	487	386	379
New Hampshire.....	613	651	678	1,030	1,050	1,180	595	620	574
New Jersey.....	2,820	3,094	3,049	4,240	4,760	5,360	665	650	569
New Mexico.....	734	808	780	3,060	2,300	2,720	240	351	287
New York.....	12,783	12,384	12,434	18,020	19,050	19,640	709	650	633
North Carolina.....	4,678	4,958	5,140	6,940	7,500	8,510	674	661	604
North Dakota.....	281	269	271	820	900	660	342	299	410
Ohio.....	5,212	5,169	5,080	8,220	9,320	9,400	634	555	540
Oklahoma.....	892	919	925	2,470	2,570	2,600	361	357	356
Oregon.....	1,574	1,613	1,539	2,480	2,510	2,990	635	643	515
Pennsylvania.....	7,784	8,194	8,362	10,810	11,830	13,040	720	693	641
Rhode Island.....	872	852	862	1,420	1,650	1,640	614	517	525
South Carolina.....	1,137	1,201	1,343	2,470	3,010	2,750	460	399	488
South Dakota.....	140	140	131	650	670	610	215	208	215
Tennessee.....	2,084	2,255	2,286	4,080	4,610	4,580	511	489	499
Texas.....	8,671	8,755	9,038	11,130	12,980	13,140	779	675	688
Utah.....	1,508	1,569	1,570	2,230	2,950	2,990	676	532	525
Vermont.....	393	380	412	910	1,100	950	431	345	434
Virginia.....	3,043	3,013	3,104	5,320	5,340	6,390	572	564	486
Washington.....	2,989	3,206	3,339	4,320	5,050	5,930	692	635	563
West Virginia.....	395	417	388	990	1,160	1,130	399	360	344
Wisconsin.....	3,258	3,189	3,044	4,680	5,080	4,820	696	628	632
Wyoming.....	218	200	190	480	540	550	455	371	345
Puerto Rico.....	168	168	186	NA	NA	NA	NA	NA	NA

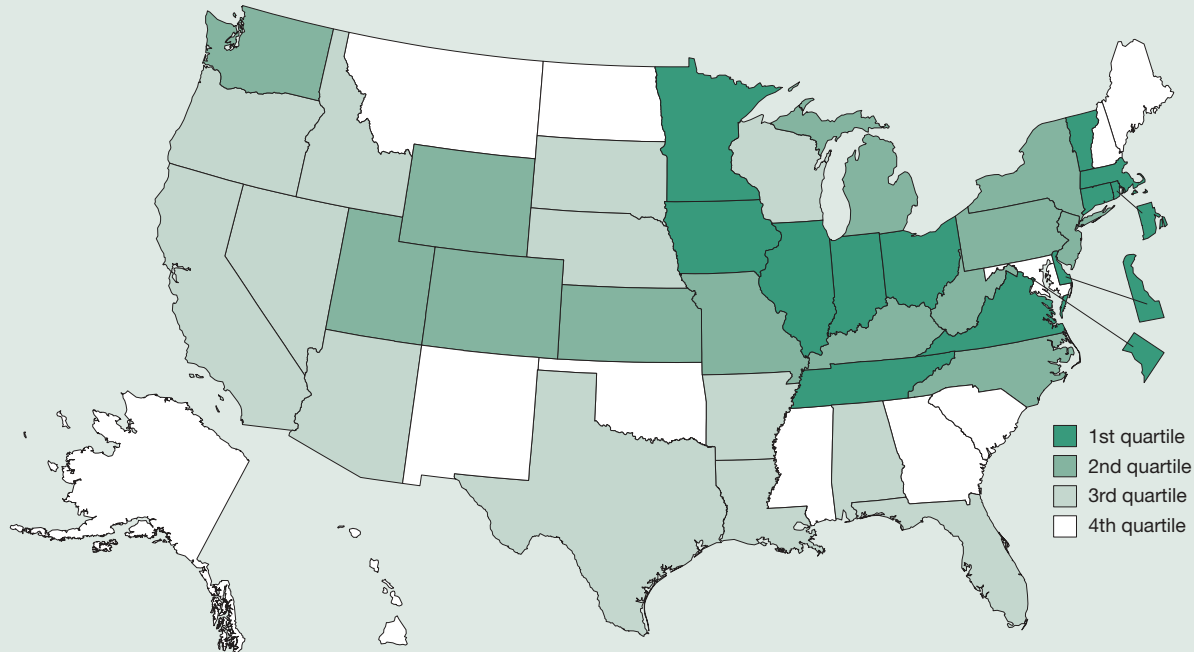
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. The Survey of Doctorate Recipients sample design does not include geography. The reliability of estimates for the 1993 S&E doctorate holders in academia for Alaska, Arkansas, Delaware, Hawaii, Idaho, Maine, Montana, Nevada, New Hampshire, North Dakota, South Dakota, Vermont, West Virginia, and Wyoming may be poor because of small sample size. The reliability of estimates for the 1997 S&E doctorate holders in academia for Alaska, Arkansas, Delaware, Hawaii, Idaho, Maine, Mississippi, Montana, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, Vermont, West Virginia, and Wyoming may be poor because of small sample size. The reliability of estimates for the 2001 S&E doctorate holders in academia for Alaska, Arkansas, Delaware, Hawaii, Idaho, Maine, Mississippi, Montana, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, Vermont, West Virginia, and Wyoming may be poor because of small sample size.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients.

Academic Article Output per \$1 Million of Academic R&D

Figure 8-19
Quartile groups for academic article output per \$1 million of academic R&D: 2001



1st quartile (7.00–5.06)	2nd quartile (5.02–4.52)	3rd quartile (4.39–3.74)	4th quartile (3.72–1.61)
Connecticut	Colorado	Alabama	Alaska
Delaware	Kansas	Arizona	Georgia
District of Columbia	Kentucky	Arkansas	Hawaii
Illinois	Michigan	California	Maine
Indiana	Missouri	Florida	Maryland
Iowa	New Jersey	Idaho	Mississippi
Massachusetts	New York	Louisiana	Montana
Minnesota	North Carolina	Nebraska	New Hampshire
Ohio	Pennsylvania	Nevada	New Mexico
Rhode Island	Utah	Oregon	North Dakota
Tennessee	Washington	South Dakota	Oklahoma
Vermont	West Virginia	Texas	South Carolina
Virginia	Wyoming	Wisconsin	

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, *Academic Research and Development Expenditures*. See table 8-19.

This indicator shows the relationship between the number of academic publications and the expenditure for academic research and development. A high value for this indicator means that a state’s academic institutions have a high publications output relative to their R&D spending. This indicator is not an efficiency measure; it is affected by the highly variable costs of R&D and by publishing conventions in different fields and institutions and thus reflects variations in field emphasis among states and institutions.

Publication counts are based on the number of articles appearing in a set of journals listed in the Institute for Scientific Information’s Science Citation Index and Social Sciences Citation Index. The number of journals was 4,601 in 1993, 5,029 in 1997, and 5,262 in 2001. Articles with authors in different institutions were counted fractionally. For a publication with N authors, each author’s institution was credited with 1/N articles. In this indicator, Maryland data exclude expenditures by the Applied Physics Laboratory at the Johns Hopkins University.

Findings

- From 1993 to 2001, the number of academic publications remained fairly constant at 140,000–150,000 annually.
- In 2001, academic researchers produced an average of 4.5 publications per \$1 million academic R&D, compared with 7.3 in 1993. This partly reflects the effects of general price inflation but may also indicate rising academic research costs.
- The value of this indicator decreased for all states between 1993 and 2001.

Table 8-19
Academic article output per \$1 million of academic R&D, by state: 1993, 1997, and 2001

State	Academic article output			Academic R&D (millions of dollars)			Academic article output per \$1 million academic R&D		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
All states.....	142,023	144,404	147,561	19,568	23,852	32,652	7.26	6.05	4.52
Alabama.....	1,787	1,911	1,896	281	369	445	6.35	5.18	4.26
Alaska.....	169	163	186	67	71	116	2.52	2.30	1.61
Arizona.....	2,249	2,256	2,199	311	377	501	7.24	5.99	4.39
Arkansas.....	562	603	608	75	103	141	7.51	5.85	4.32
California.....	18,010	17,530	18,148	2,381	3,049	4,422	7.56	5.75	4.10
Colorado.....	2,355	2,523	2,630	331	427	573	7.11	5.90	4.59
Connecticut.....	2,723	2,820	2,767	365	393	499	7.47	7.18	5.55
Delaware.....	530	499	560	53	65	80	10.07	7.66	7.00
District of Columbia.....	1,187	1,224	1,213	145	214	228	8.17	5.72	5.32
Florida.....	4,146	4,187	4,256	489	702	997	8.49	5.96	4.27
Georgia.....	2,880	3,255	3,578	547	766	989	5.27	4.25	3.62
Hawaii.....	585	574	538	74	120	157	7.91	4.78	3.43
Idaho.....	297	295	309	49	63	82	6.10	4.68	3.74
Illinois.....	7,100	6,894	7,012	758	927	1,281	9.37	7.44	5.47
Indiana.....	3,077	3,104	3,096	303	400	584	10.16	7.75	5.30
Iowa.....	2,292	2,272	2,226	299	342	440	7.67	6.65	5.06
Kansas.....	1,244	1,199	1,251	154	198	269	8.07	6.07	4.65
Kentucky.....	1,310	1,381	1,355	122	158	297	10.70	8.72	4.56
Louisiana.....	1,787	1,895	1,828	255	332	432	7.00	5.70	4.23
Maine.....	245	247	234	25	33	68	9.85	7.45	3.44
Maryland.....	4,237	4,319	4,851	1,148	1,272	1,644	3.69	3.40	2.95
Massachusetts.....	8,630	9,238	9,680	1,108	1,273	1,577	7.79	7.26	6.14
Michigan.....	4,892	4,880	5,078	700	842	1,107	6.99	5.79	4.59
Minnesota.....	2,493	2,435	2,389	332	363	469	7.50	6.70	5.09
Mississippi.....	507	628	692	106	125	242	4.79	5.04	2.86
Missouri.....	2,946	3,163	3,230	345	459	678	8.55	6.89	4.76
Montana.....	265	272	328	48	71	108	5.51	3.86	3.05
Nebraska.....	1,067	1,030	1,011	137	177	242	7.78	5.81	4.18
Nevada.....	375	370	447	79	88	116	4.74	4.19	3.86
New Hampshire.....	613	651	678	99	108	197	6.17	6.06	3.44
New Jersey.....	2,820	3,094	3,049	374	462	609	7.54	6.70	5.00
New Mexico.....	734	808	780	187	219	274	3.93	3.69	2.84
New York.....	12,783	12,384	12,434	1,554	1,780	2,476	8.23	6.96	5.02
North Carolina.....	4,678	4,958	5,140	617	802	1,137	7.59	6.18	4.52
North Dakota.....	281	269	271	54	56	85	5.18	4.80	3.20
Ohio.....	5,212	5,169	5,080	593	764	996	8.79	6.77	5.10
Oklahoma.....	892	919	925	173	187	255	5.15	4.92	3.63
Oregon.....	1,574	1,613	1,539	226	291	366	6.97	5.55	4.20
Pennsylvania.....	7,784	8,194	8,362	1,019	1,241	1,687	7.64	6.60	4.96
Rhode Island.....	872	852	862	103	112	143	8.45	7.61	6.04
South Carolina.....	1,137	1,201	1,343	178	219	361	6.38	5.48	3.72
South Dakota.....	140	140	131	22	25	32	6.31	5.68	4.08
Tennessee.....	2,084	2,255	2,286	278	330	423	7.50	6.84	5.40
Texas.....	8,671	8,755	9,038	1,398	1,607	2,244	6.20	5.45	4.03
Utah.....	1,508	1,569	1,570	195	239	338	7.74	6.57	4.64
Vermont.....	393	380	412	50	60	77	7.88	6.38	5.36
Virginia.....	3,043	3,013	3,104	404	456	611	7.53	6.61	5.08
Washington.....	2,989	3,206	3,339	428	508	707	6.99	6.31	4.73
West Virginia.....	395	417	388	55	64	79	7.19	6.56	4.91
Wisconsin.....	3,258	3,189	3,044	444	497	729	7.33	6.41	4.18
Wyoming.....	218	200	190	33	48	42	6.70	4.20	4.56
Puerto Rico.....	168	168	186	NA	NA	64	NA	NA	2.92

NA not available

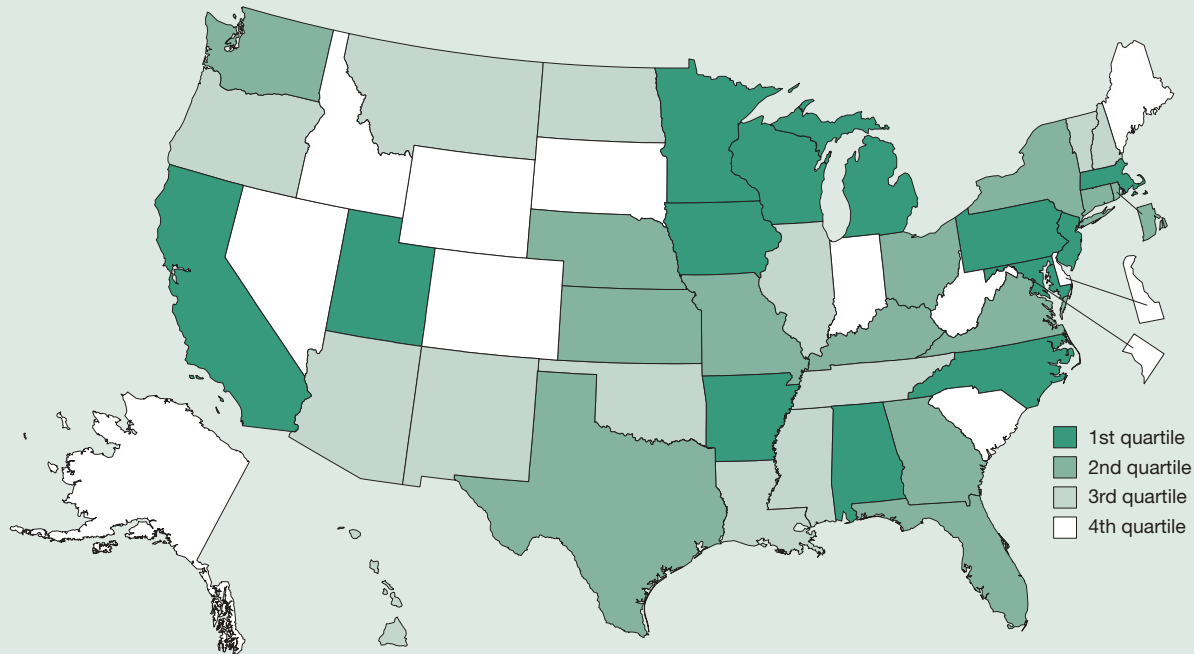
NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. In 2001, academic R&D was reported for all institutions. In 1993 and 1997, academic R&D was reported for doctorate-granting institutions only.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, *Academic Research and Development Expenditures*, various years.

Academic Patents Awarded per 1,000 S&E Doctorate Holders in Academia

Figure 8-20

Quartile groups for academic patents awarded per 1,000 S&E doctorate holders in academia: 1999



1st quartile (26.7–15.0)	2nd quartile (14.9–9.5)	3rd quartile (9.5–5.3)	4th quartile (5.1–0.0)
Alabama	Connecticut	Arizona	Alaska
Arkansas	Florida	Hawaii	Colorado
California	Georgia	Illinois	Delaware
Iowa	Kansas	Louisiana	District of Columbia
Maryland	Kentucky	Mississippi	Idaho
Massachusetts	Missouri	Montana	Indiana
Michigan	Nebraska	New Hampshire	Maine
Minnesota	New York	New Mexico	Nevada
New Jersey	Ohio	North Dakota	South Carolina
North Carolina	Rhode Island	Oklahoma	South Dakota
Pennsylvania	Texas	Oregon	West Virginia
Utah	Virginia	Tennessee	Wyoming
Wisconsin	Washington	Vermont	

SOURCES: U.S. Patent and Trademark Office, Technology Assessment and Forecast Branch, *U.S. Colleges and Universities—Utility Patent Grants, Calendar Years 1969–2000*; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients. See table 8-20.

Since the early 1980s, academic institutions have increasingly been viewed as engines of economic growth. Growing attention has been paid to the results of academic research and development in terms of its role in developing new products, processes, and services. One indicator of such R&D results is the volume of academic patents. Academic patenting is highly concentrated and partly reflects the resources devoted to institutional patenting offices.

This indicator relates the volume of academic patents to the size of the doctoral S&E workforce in academia. It is an approximate measure of the degree to which results with perceived economic value are generated by the doctoral academic workforce.

S&E doctorates include physical, life, computer, earth, atmospheric, ocean, and social sciences; mathematics; engineering; and psychology. Medical doctorates and S&E doctorates from foreign institutions are excluded.

Findings

- The number of patents awarded to academic institutions more than doubled between 1993 and 1999, from about 1,600 to 3,300, whereas the number of academic S&E doctorate holders rose by 14 percent.
- In 1999, 14 patents were produced for each 1,000 S&E doctorate holders employed in academia, which was almost double the number in 1993.
- The rise in this indicator suggests that states and their universities may be focusing on academic patenting more than in the past.
- States vary widely on this indicator, which ranges from 0 to 27 patents per 1,000 S&E doctorate holders employed in academia.

Table 8-20
Academic patents awarded per 1,000 S&E doctorate holders in academia, by state: 1993, 1997, and 1999

State	Patents awarded to academic institutions			S&E doctorate holders in academia			Patents per 1,000 S&E doctorate holders in academia		
	1993	1997	1999	1993	1997	1999	1993	1997	1999
All states.....	1,619	2,436	3,340	209,070	232,100	238,990	7.7	10.5	14.0
Alabama.....	11	23	48	3,010	4,480	3,200	3.7	5.1	15.0
Alaska*.....	1	2	0	530	430	540	1.9	4.7	0.0
Arizona.....	6	21	18	2,540	2,740	2,790	2.4	7.7	6.5
Arkansas*.....	8	8	31	1,210	1,490	1,660	6.6	5.4	18.7
California.....	211	409	641	21,330	23,970	23,990	9.9	17.1	26.7
Colorado.....	20	30	19	3,580	4,400	4,620	5.6	6.8	4.1
Connecticut.....	25	34	45	3,540	3,830	4,460	7.1	8.9	10.1
Delaware*.....	5	4	2	650	710	670	7.7	5.6	3.0
District of Columbia.....	18	28	14	2,010	2,180	2,760	9.0	12.8	5.1
Florida.....	60	94	95	5,720	6,110	7,030	10.5	15.4	13.5
Georgia.....	49	42	70	4,050	5,260	5,480	12.1	8.0	12.8
Hawaii*.....	8	6	8	1,340	1,240	1,360	6.0	4.8	5.9
Idaho*.....	0	0	0	810	750	760	0.0	0.0	0.0
Illinois.....	38	78	95	9,650	10,080	10,020	3.9	7.7	9.5
Indiana.....	10	38	24	4,460	4,560	5,160	2.2	8.3	4.7
Iowa.....	41	51	78	2,940	3,090	3,290	13.9	16.5	23.7
Kansas*.....	12	7	23	2,050	2,230	1,860	5.9	3.1	12.4
Kentucky.....	5	16	32	2,500	2,920	3,070	2.0	5.5	10.4
Louisiana.....	22	26	17	3,230	3,420	3,210	6.8	7.6	5.3
Maine*.....	0	0	1	1,190	1,310	1,280	0.0	0.0	0.8
Maryland.....	54	66	134	4,520	5,820	5,490	11.9	11.3	24.4
Massachusetts.....	171	188	271	10,930	11,500	13,120	15.6	16.3	20.7
Michigan.....	48	104	120	7,000	7,690	7,740	6.9	13.5	15.5
Minnesota.....	37	50	77	3,890	4,300	5,000	9.5	11.6	15.4
Mississippi*.....	5	6	14	1,840	1,890	2,030	2.7	3.2	6.9
Missouri.....	26	40	78	4,360	5,480	5,230	6.0	7.3	14.9
Montana*.....	1	4	8	880	1,020	1,030	1.1	3.9	7.8
Nebraska*.....	10	27	23	1,770	2,310	1,810	5.6	11.7	12.7
Nevada*.....	0	2	3	770	960	920	0.0	2.1	3.3
New Hampshire*.....	4	3	8	1,030	1,050	1,020	3.9	2.9	7.8
New Jersey.....	27	52	85	4,240	4,760	4,610	6.4	10.9	18.4
New Mexico.....	7	18	21	3,060	2,300	2,620	2.3	7.8	8.0
New York.....	163	224	291	18,020	19,050	19,890	9.0	11.8	14.6
North Carolina.....	65	96	124	6,940	7,500	8,020	9.4	12.8	15.5
North Dakota*.....	5	5	6	820	900	780	6.1	5.6	7.7
Ohio.....	58	75	94	8,220	9,320	9,860	7.1	8.0	9.5
Oklahoma.....	14	17	21	2,470	2,570	2,410	5.7	6.6	8.7
Oregon.....	12	27	22	2,480	2,510	2,940	4.8	10.8	7.5
Pennsylvania.....	86	138	211	10,810	11,830	12,800	8.0	11.7	16.5
Rhode Island*.....	1	9	19	1,420	1,650	1,710	0.7	5.5	11.1
South Carolina.....	6	14	11	2,470	3,010	2,700	2.4	4.7	4.1
South Dakota*.....	0	2	1	650	670	660	0.0	3.0	1.5
Tennessee.....	11	25	27	4,080	4,610	4,310	2.7	5.4	6.3
Texas.....	124	125	147	11,130	12,980	12,880	11.1	9.6	11.4
Utah.....	35	37	42	2,230	2,950	2,740	15.7	12.5	15.3
Vermont*.....	1	3	6	910	1,100	990	1.1	2.7	6.1
Virginia.....	28	49	67	5,320	5,340	6,290	5.3	9.2	10.7
Washington.....	13	42	57	4,320	5,050	5,430	3.0	8.3	10.5
West Virginia*.....	0	2	1	990	1,160	1,140	0.0	1.7	0.9
Wisconsin.....	57	65	87	4,680	5,080	5,020	12.2	12.8	17.3
Wyoming*.....	0	4	3	480	540	590	0.0	7.4	5.1
Puerto Rico.....	1	0	0	NA	NA	NA	NA	NA	NA

NA not available

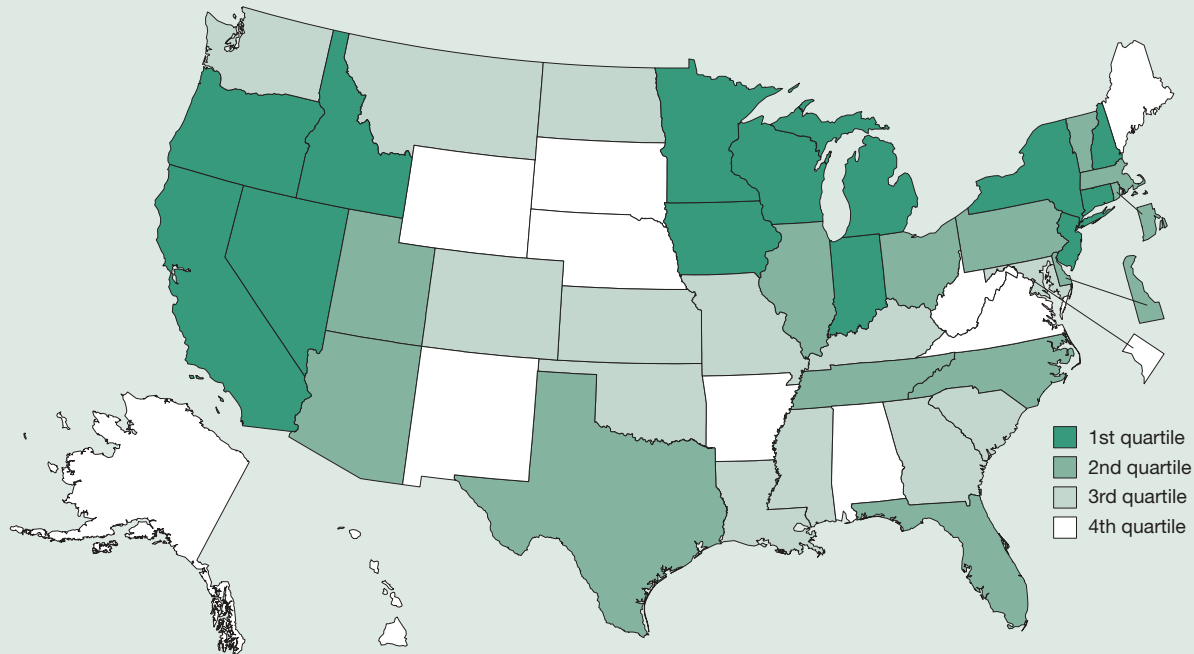
*Reliability of estimates for some states may be poor because of small sample size.

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. The Survey of Doctorate Recipients sample design does not include geography.

SOURCES: U.S. Patent and Trademark Office, Technology Assessment and Forecast Branch, *U.S. Colleges and Universities—Utility Patent Grants, Calendar Years 1969–2000*; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients.

Patents Awarded per 1,000 Individuals in S&E Occupations

Figure 8-21
 Quartile groups for patents awarded per 1,000 individuals in S&E occupations: 1999



1st quartile (81.5–30.5)	2nd quartile (30.1–20.9)	3rd quartile (20.5–14.0)	4th quartile (13.4–1.2)
California	Arizona	Colorado	Alabama
Connecticut	Delaware	Georgia	Alaska
Idaho	Florida	Kansas	Arkansas
Indiana	Illinois	Kentucky	District of Columbia
Iowa	Massachusetts	Louisiana	Hawaii
Michigan	North Carolina	Maryland	Maine
Minnesota	Ohio	Mississippi	Nebraska
Nevada	Pennsylvania	Missouri	New Mexico
New Hampshire	Rhode Island	Montana	South Dakota
New Jersey	Tennessee	North Dakota	Virginia
New York	Texas	Oklahoma	West Virginia
Oregon	Utah	South Carolina	Wyoming
Wisconsin	Vermont	Washington	

SOURCES: U.S. Patent and Trademark Office, Information Products Division/Technology Assessment and Forecast Branch, *Patent Counts by Country/State and Year, All Patents, All Types, January 1, 1977–December 31, 2001*; and National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT). See table 8-21.

This indicator shows state patent activity normalized to the size of its science and engineering workforce, specifically employees in S&E occupations. People in S&E occupations include computer, mathematical, life, physical, and social scientists; engineers; and postsecondary teachers in any of these fields. Managers, elementary and secondary school teachers, and medical personnel are excluded.

The U.S. Patent and Trademark Office classifies patents based on the residence of the first-named inventor. Only U.S.-origin patents are included.

Because of the different methods of assigning geographic location to the two indicator measures, this indicator is of limited applicability for sparsely populated states or for locations where a large percentage of the population lives in one state or region and works in another.

Findings

- The number of patents issued rose sharply between 1995 and 1999, from 64,500 to 94,000.
- In 1999, the state average for this indicator was 26.7 patents per 1,000 individuals in an S&E occupation, compared with 20.3 in 1995.
- The District of Columbia and Idaho were outliers, at 1.2 and 81.5, respectively, the latter reflecting the presence of a high-patenting Department of Energy National Laboratory in this sparsely populated state.
- The remaining states' values ranged widely on this indicator, from 8.3 to 38.3 patents per 1,000 individuals.

Table 8-21
Patents awarded per 1,000 individuals in S&E occupations, by state: 1995, 1997, and 1999

State	Patents awarded			Individuals in S&E occupations			Patents per 1,000 individuals in S&E occupations		
	1995	1997	1999	1995	1997	1999	1995	1997	1999
All states.....	64,480	69,898	94,046	3,178,000	3,357,000	3,525,100	20.3	20.8	26.7
Alabama	359	345	473	40,800	44,300	43,300	8.8	7.8	10.9
Alaska	49	60	66	6,600	6,300	7,700	7.4	9.5	8.6
Arizona	1,120	1,162	1,623	47,400	54,000	55,700	23.6	21.5	29.1
Arkansas	143	152	226	14,100	15,300	16,900	10.1	9.9	13.4
California	10,824	12,915	18,860	463,900	478,000	492,000	23.3	27.0	38.3
Colorado	1,207	1,345	1,987	82,700	88,500	96,900	14.6	15.2	20.5
Connecticut.....	1,768	1,644	2,026	56,900	53,300	57,500	31.1	30.8	35.2
Delaware	442	370	444	14,300	15,700	16,300	30.9	23.6	27.2
District of Columbia	63	59	63	53,200	51,300	53,900	1.2	1.2	1.2
Florida	2,465	2,552	3,040	105,500	116,600	123,000	23.4	21.9	24.7
Georgia.....	1,047	1,112	1,544	69,800	75,600	85,900	15.0	14.7	18.0
Hawaii.....	84	93	97	13,100	11,500	11,700	6.4	8.1	8.3
Idaho	329	597	1,263	13,200	13,900	15,500	24.9	42.9	81.5
Illinois	3,479	3,539	4,308	138,300	148,600	155,200	25.2	23.8	27.8
Indiana.....	1,281	1,331	1,707	51,300	54,000	56,000	25.0	24.6	30.5
Iowa.....	486	450	817	22,100	24,500	23,900	22.0	18.4	34.2
Kansas	319	322	495	29,500	34,300	31,400	10.8	9.4	15.8
Kentucky	341	350	509	22,700	23,100	26,100	15.0	15.2	19.5
Louisiana.....	413	408	519	35,900	36,200	35,500	11.5	11.3	14.6
Maine.....	137	109	145	7,900	11,600	11,200	17.3	9.4	12.9
Maryland	1,100	1,264	1,642	93,300	93,900	104,100	11.8	13.5	15.8
Massachusetts.....	2,427	2,831	3,819	130,900	136,600	148,800	18.5	20.7	25.7
Michigan.....	3,046	3,075	4,030	116,700	122,900	131,800	26.1	25.0	30.6
Minnesota	1,943	2,059	2,902	69,400	76,800	81,600	28.0	26.8	35.6
Mississippi	138	182	225	15,700	14,100	16,100	8.8	12.9	14.0
Missouri.....	819	870	1,087	53,100	59,700	61,000	15.4	14.6	17.8
Montana.....	141	105	142	8,100	10,200	8,600	17.4	10.3	16.5
Nebraska.....	150	185	229	15,300	15,200	19,900	9.8	12.2	11.5
Nevada.....	216	226	356	11,600	10,100	10,800	18.6	22.4	33.0
New Hampshire	460	503	692	14,000	17,000	19,100	32.9	29.6	36.2
New Jersey	3,065	3,461	4,371	118,900	118,500	121,200	25.8	29.2	36.1
New Mexico	280	281	357	25,100	25,900	28,600	11.2	10.8	12.5
New York.....	5,266	5,421	6,903	197,400	206,900	216,000	26.7	26.2	32.0
North Carolina.....	1,255	1,501	1,956	75,000	84,500	93,800	16.7	17.8	20.9
North Dakota.....	63	50	76	4,500	4,300	4,700	14.0	11.6	16.2
Ohio	2,986	3,295	4,003	119,900	138,600	132,900	24.9	23.8	30.1
Oklahoma.....	545	453	545	25,500	28,600	28,100	21.4	15.8	19.4
Oregon.....	870	1,103	1,386	37,800	39,800	43,400	23.0	27.7	31.9
Pennsylvania.....	2,926	2,934	4,077	137,700	141,800	143,300	21.2	20.7	28.5
Rhode Island	263	303	341	15,600	13,500	14,200	16.9	22.4	24.0
South Carolina	521	499	654	31,800	34,200	37,500	16.4	14.6	17.4
South Dakota	44	53	78	5,400	5,400	7,000	8.1	9.8	11.1
Tennessee	708	745	1,018	50,400	47,100	44,400	14.0	15.8	22.9
Texas	4,314	4,449	6,425	229,600	232,300	254,800	18.8	19.2	25.2
Utah	554	666	748	26,100	24,400	25,200	21.2	27.3	29.7
Vermont.....	171	290	363	8,800	10,200	12,500	19.4	28.4	29.0
Virginia.....	944	917	1,151	104,500	116,200	124,100	9.0	7.9	9.3
Washington	1,257	1,510	2,038	75,800	97,900	101,500	16.6	15.4	20.1
West Virginia.....	151	165	166	12,000	14,100	16,500	12.6	11.7	10.1
Wisconsin.....	1,426	1,527	1,996	52,500	54,000	53,200	27.2	28.3	37.5
Wyoming.....	75	60	58	6,400	5,700	4,800	11.7	10.5	12.1
Puerto Rico	24	14	33	NA	NA	NA	NA	NA	NA

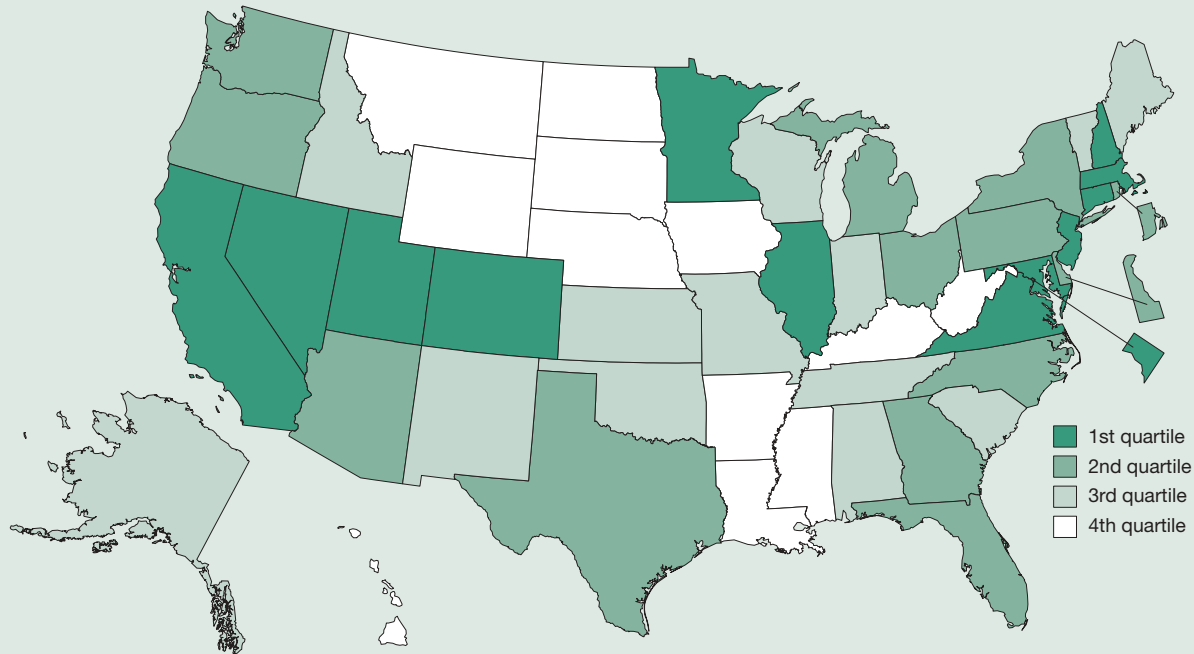
NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. Patents issued include utility patents and other types of U.S. documents (i.e., design patents, plant patents, reissues, defensive publications, and statutory invention registrations). The origin of a patent is determined by the residence of the first-named inventor. Individuals in S&E occupations include those who are employed in S&E at the time of survey and are included in one of the following two groups: (1) have ever received a bachelor's or higher degree in an S&E field or (2) have a non-S&E bachelor's or higher degree and were in an S&E occupation at the time of the 1993 Scientists and Engineers Statistical Data System (SESTAT) surveys. S&E occupations include mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any S&E degree field. Because SESTAT survey sample designs do not include geography, the reliability of estimates in some states may be poor because of small sample size.

SOURCES: U.S. Patent and Trademark Office, Information Products Division/Technology Assessment and Forecast Branch, *Patent Counts by Country/State and Year, All Patents, All Types, January 1, 1977–December 31, 2001, 2002*; and National Science Foundation, Division of Science Resources Statistics, SESTAT.

High-Technology Share of All Business Establishments

Figure 8-22
Quartile groups for high-technology share of all business establishments: 2000



1st quartile (10.53–6.71 percent)	2nd quartile (6.54–5.31 percent)	3rd quartile (5.21–4.22 percent)	4th quartile (4.21–2.98 percent)
California	Arizona	Alabama	Arkansas
Colorado	Delaware	Alaska	Hawaii
Connecticut	Florida	Idaho	Iowa
District of Columbia	Georgia	Indiana	Kentucky
Illinois	Michigan	Kansas	Louisiana
Maryland	New York	Maine	Mississippi
Massachusetts	North Carolina	Missouri	Montana
Minnesota	Ohio	New Mexico	Nebraska
Nevada	Oregon	Oklahoma	North Dakota
New Hampshire	Pennsylvania	South Carolina	South Dakota
New Jersey	Rhode Island	Tennessee	West Virginia
Utah	Texas	Vermont	Wyoming
Virginia	Washington	Wisconsin	

SOURCES: U.S. Bureau of the Census, Standard Statistical Establishment List, special tabulations; and U.S. Bureau of the Census, *County Business Patterns*. See table 8-22.

This indicator measures the portion of business establishments that are classified as high-technology industries. High-technology industries are identified as those having at least twice the employment proportion of the all-industries average, both in research and development and in all technology occupations.

State economies with a high percentage of their business establishments in high-technology industries are likely to be well positioned to take advantage of new technological advances. Because of a recent change in the industrial classification system, this indicator covers only 1998–2000.

Findings

- The number of high-technology establishments rose from 402,000 in 1998 to 428,000 in 2000.
- The percentage of establishments classified as high technology grew from 5.8 to 6.1 percent of total business establishments in the period 1998–2000.
- The state distribution of this indicator is similar to that of three other indicators: bachelor’s degree holders, S&E doctoral degree holders in the workforce, and workforce in S&E occupations.

Table 8-22
High-technology share of all business establishments, by state: 1998, 1999, and 2000

State	High-technology establishments			All business establishments			High-technology/business establishments (percent)		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
All states.....	402,096	415,466	428,061	6,941,822	7,008,444	7,070,048	5.79	5.93	6.05
Alabama.....	4,068	4,162	4,208	100,316	100,507	99,817	4.06	4.14	4.22
Alaska.....	730	762	783	18,212	18,433	18,501	4.01	4.13	4.23
Arizona.....	6,877	7,155	7,493	110,245	112,545	114,804	6.24	6.36	6.53
Arkansas.....	2,003	2,090	2,170	62,353	62,737	63,185	3.21	3.33	3.43
California.....	54,998	57,602	60,799	773,925	784,935	799,863	7.11	7.34	7.60
Colorado.....	10,472	10,865	11,361	130,354	133,743	137,528	8.03	8.12	8.26
Connecticut.....	6,376	6,357	6,356	92,362	92,454	92,436	6.90	6.88	6.88
Delaware.....	1,327	1,392	1,426	22,871	23,381	23,771	5.80	5.95	6.00
District of Columbia.....	1,906	2,005	2,069	19,571	19,469	19,655	9.74	10.30	10.53
Florida.....	23,982	25,037	25,873	420,638	424,089	428,438	5.70	5.90	6.04
Georgia.....	12,234	12,706	13,110	194,213	197,759	200,442	6.30	6.42	6.54
Hawaii.....	1,162	1,225	1,256	29,603	29,569	29,853	3.93	4.14	4.21
Idaho.....	1,435	1,551	1,632	35,961	36,975	37,429	3.99	4.19	4.36
Illinois.....	20,643	21,292	21,479	304,533	306,899	308,067	6.78	6.94	6.97
Indiana.....	6,790	6,970	7,049	146,197	146,528	146,321	4.64	4.76	4.82
Iowa.....	2,604	2,672	2,677	80,838	81,213	80,890	3.22	3.29	3.31
Kansas.....	3,309	3,466	3,611	74,019	74,486	74,939	4.47	4.65	4.82
Kentucky.....	3,381	3,495	3,491	89,593	89,946	89,921	3.77	3.89	3.88
Louisiana.....	4,132	4,150	4,223	100,667	101,020	101,016	4.10	4.11	4.18
Maine.....	1,585	1,667	1,708	38,334	38,878	39,466	4.13	4.29	4.33
Maryland.....	9,337	9,713	10,030	126,577	127,431	128,467	7.38	7.62	7.81
Massachusetts.....	13,949	14,281	14,598	167,929	173,267	176,222	8.31	8.24	8.28
Michigan.....	12,839	13,081	13,255	235,403	236,456	236,912	5.45	5.53	5.59
Minnesota.....	9,384	9,714	10,014	134,981	137,305	139,080	6.95	7.07	7.20
Mississippi.....	1,832	1,835	1,866	59,771	59,834	59,788	3.07	3.07	3.12
Missouri.....	6,355	6,558	6,667	143,912	144,874	144,755	4.42	4.53	4.61
Montana.....	1,206	1,263	1,321	30,957	31,365	31,849	3.90	4.03	4.15
Nebraska.....	1,834	1,858	1,955	48,655	48,968	49,623	3.77	3.79	3.94
Nevada.....	2,814	3,021	3,233	44,613	46,890	48,178	6.31	6.44	6.71
New Hampshire.....	2,840	2,846	2,874	36,842	37,180	37,414	7.71	7.65	7.68
New Jersey.....	18,964	19,550	20,089	230,860	231,823	233,559	8.21	8.43	8.60
New Mexico.....	2,143	2,192	2,227	42,608	42,918	42,782	5.03	5.11	5.21
New York.....	25,289	26,291	27,507	481,962	485,954	492,073	5.25	5.41	5.59
North Carolina.....	10,078	10,468	10,887	198,690	201,706	203,903	5.07	5.19	5.34
North Dakota.....	570	592	606	20,288	20,380	20,139	2.81	2.90	3.01
Ohio.....	14,234	14,481	14,566	270,343	270,766	270,509	5.27	5.35	5.38
Oklahoma.....	3,752	3,774	3,810	84,881	84,854	85,094	4.42	4.45	4.48
Oregon.....	5,468	5,576	5,693	99,183	99,945	100,645	5.51	5.58	5.66
Pennsylvania.....	15,320	15,725	16,090	292,659	293,491	294,741	5.23	5.36	5.46
Rhode Island.....	1,444	1,464	1,516	28,245	28,240	28,534	5.11	5.18	5.31
South Carolina.....	3,942	4,102	4,119	94,985	96,440	97,146	4.15	4.25	4.24
South Dakota.....	684	694	723	23,521	23,693	23,783	2.91	2.93	3.04
Tennessee.....	5,421	5,520	5,561	131,110	131,116	130,876	4.13	4.21	4.25
Texas.....	27,094	27,734	28,410	462,875	467,087	471,509	5.85	5.94	6.03
Utah.....	3,399	3,529	3,750	52,025	53,809	55,379	6.53	6.56	6.77
Vermont.....	1,068	1,079	1,109	21,261	21,598	21,564	5.02	5.00	5.14
Virginia.....	12,767	13,423	14,015	172,182	173,550	175,582	7.41	7.73	7.98
Washington.....	9,627	9,913	10,175	161,473	162,932	164,018	5.96	6.08	6.20
West Virginia.....	1,208	1,243	1,224	41,703	41,451	41,047	2.90	3.00	2.98
Wisconsin.....	6,497	6,598	6,655	138,635	139,646	140,415	4.69	4.72	4.74
Wyoming.....	723	727	742	17,888	17,909	18,120	4.04	4.06	4.09
Puerto Rico.....	NA	NA	NA	42,577	43,464	44,015	NA	NA	NA

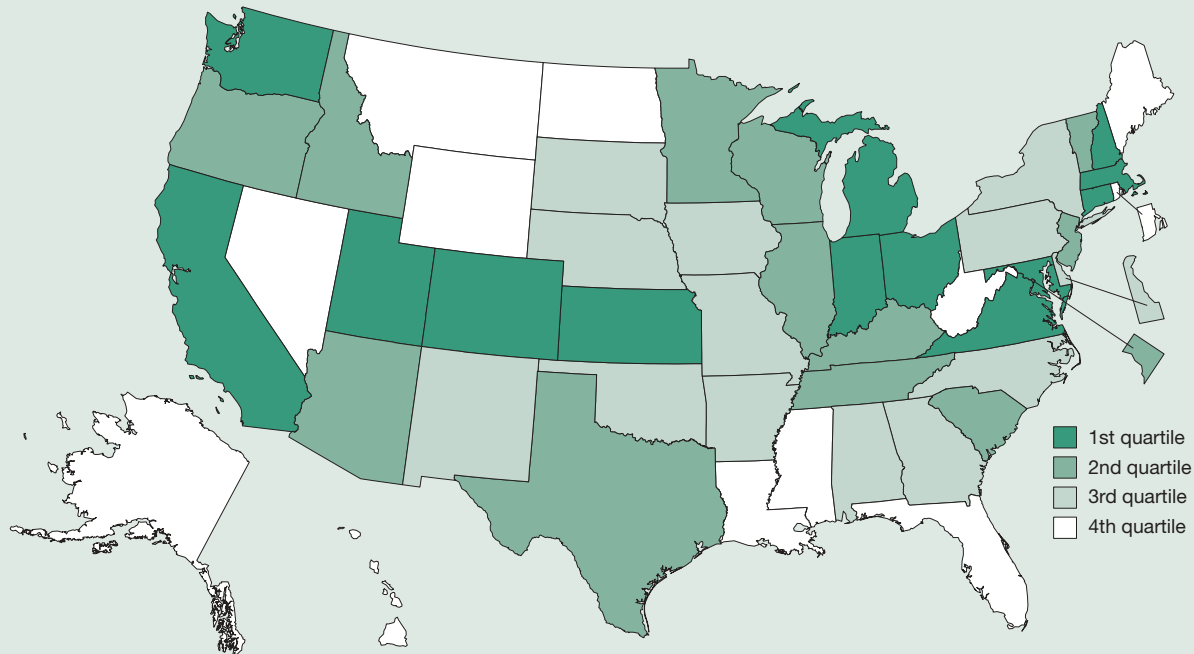
NA not available

NOTE: The state total for each year is the sum of the 50 states and the District of Columbia.

SOURCES: U.S. Bureau of the Census, Standard Statistical Establishment List, special tabulations; and U.S. Bureau of the Census, *County Business Patterns*, various years.

Employment in High-Technology Establishments as Share of Total Employment

Figure 8-23
Quartile groups for employment in high-technology establishments as share of total employment: 2000



1st quartile (12.62–9.68 percent)	2nd quartile (9.62–7.99 percent)	3rd quartile (7.98–6.52 percent)	4th quartile (6.24–2.38 percent)
California	Arizona	Alabama	Alaska
Colorado	District of Columbia	Arkansas	Florida
Connecticut	Idaho	Delaware	Hawaii
Indiana	Illinois	Georgia	Louisiana
Kansas	Kentucky	Iowa	Maine
Maryland	Minnesota	Missouri	Mississippi
Massachusetts	New Jersey	Nebraska	Montana
Michigan	Oregon	New Mexico	Nevada
New Hampshire	South Carolina	New York	North Dakota
Ohio	Tennessee	North Carolina	Rhode Island
Utah	Texas	Oklahoma	West Virginia
Virginia	Vermont	Pennsylvania	Wyoming
Washington	Wisconsin	South Dakota	

SOURCES: U.S. Bureau of the Census, Standard Statistical Establishment List, special tabulations; and U.S. Bureau of the Census, *County Business Patterns*. See table 8-23.

This indicator measures the extent to which the workforce in a state is employed in high-technology industries. High-technology industries are identified as those with at least twice the share of employment of the all-industries average, in both research and development in all technology occupations.

State economies with a high value for this indicator are probably well positioned to take advantage of new technological advances because they have a relatively larger pool of experienced high-technology workers. Because of a recent shift in the industrial classification system, this indicator covers only 1998–2000.

Findings

- High-technology employment grew from 9.6 to 10.1 million workers over the 1998–2000 period, but total employment grew marginally faster.
- High-technology employment for the period ranged from about 8.8 to 8.9 percent of the total workforce.
- Not surprisingly, states were distributed similarly on the high-technology employment and high-technology establishment indicators.
- On the high-technology employment indicator, states varied greatly in 2000, ranging from 2.4 to 12.6 percent.

Table 8-23
Employment in high-technology establishments as share of total employment, by state: 1998, 1999, and 2000

State	Employment in high-technology establishment			All employment			High-technology/ all employment (percent)		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
All states.....	9,649,938	9,836,581	10,086,689	108,117,731	110,705,661	114,064,976	8.93	8.89	8.84
Alabama.....	113,340	117,681	119,207	1,604,110	1,633,909	1,653,074	7.07	7.20	7.21
Alaska.....	6,518	6,660	7,772	196,135	198,459	204,887	3.32	3.36	3.79
Arizona.....	157,010	152,917	166,678	1,763,508	1,838,277	1,919,353	8.90	8.32	8.68
Arkansas.....	62,620	62,576	64,564	944,935	954,948	990,830	6.63	6.55	6.52
California.....	1,312,754	1,335,536	1,397,776	12,026,989	12,356,363	12,884,692	10.92	10.81	10.85
Colorado.....	166,494	176,315	190,282	1,757,628	1,821,717	1,913,302	9.47	9.68	9.95
Connecticut.....	160,575	163,679	166,788	1,493,964	1,530,539	1,546,250	10.75	10.69	10.79
Delaware.....	29,932	30,138	29,208	354,643	360,735	377,277	8.44	8.35	7.74
District of Columbia.....	32,038	34,325	36,111	402,070	404,372	414,983	7.97	8.49	8.70
Florida.....	316,257	328,324	339,093	5,756,353	5,954,982	6,217,386	5.49	5.51	5.45
Georgia.....	228,511	244,728	256,208	3,198,950	3,363,797	3,483,500	7.14	7.28	7.35
Hawaii.....	8,258	9,475	10,292	416,571	419,047	432,092	1.98	2.26	2.38
Idaho.....	41,044	40,176	43,356	423,615	434,461	450,788	9.69	9.25	9.62
Illinois.....	476,305	485,905	491,433	5,221,782	5,342,675	5,501,036	9.12	9.09	8.93
Indiana.....	291,151	293,800	302,599	2,540,866	2,580,408	2,650,774	11.46	11.39	11.42
Iowa.....	100,990	102,359	101,015	1,213,285	1,239,354	1,265,064	8.32	8.26	7.98
Kansas.....	117,366	117,303	116,476	1,081,941	1,111,884	1,128,732	10.85	10.55	10.32
Kentucky.....	116,730	120,628	126,237	1,443,015	1,469,315	1,513,722	8.09	8.21	8.34
Louisiana.....	94,915	90,385	89,305	1,577,220	1,579,949	1,592,357	6.02	5.72	5.61
Maine.....	22,534	24,051	26,310	456,715	475,149	491,780	4.93	5.06	5.35
Maryland.....	192,782	199,997	203,618	1,938,727	1,988,950	2,058,304	9.94	10.06	9.89
Massachusetts.....	357,070	371,152	388,928	2,924,913	2,971,052	3,087,044	12.21	12.49	12.60
Michigan.....	507,762	513,378	514,017	3,919,567	3,996,300	4,072,786	12.95	12.85	12.62
Minnesota.....	201,359	207,282	210,453	2,271,671	2,338,642	2,395,361	8.86	8.86	8.79
Mississippi.....	60,182	56,924	56,283	937,023	948,883	956,781	6.42	6.00	5.88
Missouri.....	201,038	195,800	178,522	2,310,122	2,350,965	2,398,979	8.70	8.33	7.44
Montana.....	10,312	11,108	12,256	277,144	288,358	296,220	3.72	3.85	4.14
Nebraska.....	57,718	57,370	59,228	720,252	733,905	751,076	8.01	7.82	7.89
Nevada.....	26,300	28,180	31,814	800,861	854,358	902,775	3.28	3.30	3.52
New Hampshire.....	58,282	56,455	53,475	518,526	528,902	546,400	11.24	10.67	9.79
New Jersey.....	299,146	314,335	322,935	3,368,365	3,440,721	3,548,429	8.88	9.14	9.10
New Mexico.....	43,681	43,489	43,137	540,186	541,386	549,352	8.09	8.03	7.85
New York.....	486,679	497,419	513,472	6,993,814	7,135,960	7,353,209	6.96	6.97	6.98
North Carolina.....	260,203	265,907	268,284	3,223,178	3,324,155	3,385,492	8.07	8.00	7.92
North Dakota.....	15,542	16,562	15,916	249,476	250,292	255,178	6.23	6.62	6.24
Ohio.....	479,462	478,007	484,110	4,806,046	4,867,368	5,001,980	9.98	9.82	9.68
Oklahoma.....	86,402	84,772	85,533	1,167,709	1,171,356	1,201,606	7.40	7.24	7.12
Oregon.....	108,322	111,244	108,254	1,310,750	1,332,403	1,355,442	8.26	8.35	7.99
Pennsylvania.....	375,364	387,493	394,786	4,906,190	4,986,591	5,087,237	7.65	7.77	7.76
Rhode Island.....	23,134	23,782	24,809	402,485	405,445	415,168	5.75	5.87	5.98
South Carolina.....	140,065	137,783	137,014	1,526,106	1,561,727	1,601,532	9.18	8.82	8.56
South Dakota.....	24,438	24,217	23,346	289,422	295,139	306,704	8.44	8.21	7.61
Tennessee.....	189,396	192,935	195,796	2,299,348	2,338,780	2,390,322	8.24	8.25	8.19
Texas.....	685,349	684,424	703,206	7,570,820	7,763,815	8,026,438	9.05	8.82	8.76
Utah.....	84,581	86,233	89,486	866,146	889,355	917,089	9.77	9.70	9.76
Vermont.....	20,766	21,262	22,761	239,034	246,320	253,541	8.69	8.63	8.98
Virginia.....	308,922	326,351	348,426	2,700,589	2,791,977	2,903,548	11.44	11.69	12.00
Washington.....	241,200	248,509	258,234	2,134,598	2,209,129	2,267,485	11.30	11.25	11.39
West Virginia.....	31,065	31,039	30,903	547,234	545,495	558,171	5.68	5.69	5.54
Wisconsin.....	211,695	219,624	220,093	2,319,343	2,368,404	2,414,834	9.13	9.27	9.11
Wyoming.....	6,379	6,587	6,884	163,791	169,188	174,614	3.89	3.89	3.94
Puerto Rico.....	NA	NA	NA	687,707	720,226	727,449	NA	NA	NA

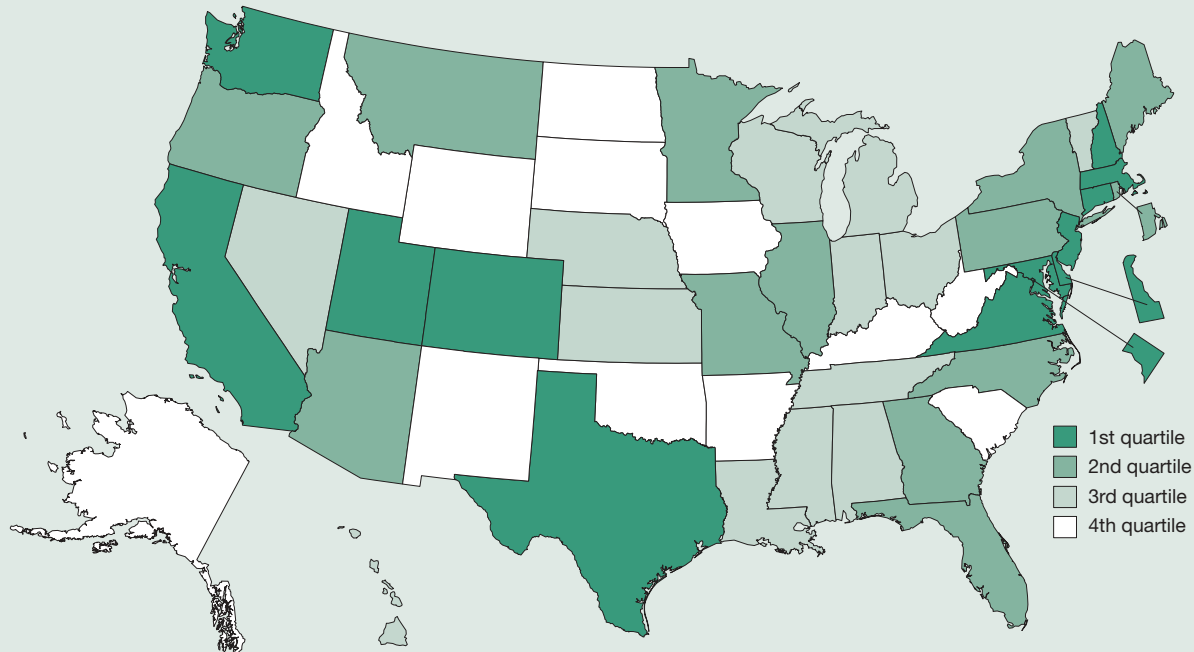
NA not available

NOTE: The state total for each year is the sum of the 50 states and the District of Columbia.

SOURCES: U.S. Bureau of the Census, Standard Statistical Establishment List, special tabulations; and U.S. Bureau of the Census, *County Business Patterns*, various years.

Venture Capital Disbursed per \$1,000 of Gross State Product

Figure 8-24
 Quartile groups for venture capital disbursed per \$1,000 GSP: 2001



1st quartile (\$17.07–\$3.13)	2nd quartile (\$3.05–\$0.95)	3rd quartile (\$0.87–\$0.28)	4th quartile (\$0.26–0.00)
California	Arizona	Alabama	Alaska
Colorado	Florida	Hawaii	Arkansas
Connecticut	Georgia	Indiana	Idaho
Delaware	Illinois	Kansas	Iowa
District of Columbia	Maine	Louisiana	Kentucky
Maryland	Minnesota	Michigan	New Mexico
Massachusetts	Missouri	Mississippi	North Dakota
New Hampshire	Montana	Nebraska	Oklahoma
New Jersey	New York	Nevada	South Carolina
Texas	North Carolina	Ohio	South Dakota
Utah	Oregon	Tennessee	West Virginia
Virginia	Pennsylvania	Vermont	Wyoming
Washington	Rhode Island	Wisconsin	

SOURCES: PricewaterhouseCoopers, Thomson Venture Economics, and National Venture Capital Association MoneyTree Survey; U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data; and Government of Puerto Rico. See table 8-24.

Venture capital represents an important source of funding for start-up companies. This indicator was designed to show the relative magnitude of venture capital investments in a state after adjusting for the size of the state’s economy. The indicator is expressed as dollars of venture capi-

tal disbursed per \$1,000 gross state product (GSP).

Data for this indicator were calculated for 1995, 1998, and 2001. Although venture capital data are available for 2002, GSP values have not been released.

Findings

- The amount of venture capital invested in the United States increased more than 10-fold, from nearly \$8 billion in 1995 to a record \$106 billion in 2000, before falling to \$41 billion in 2001. (By 2002, it declined to \$21 billion.)
- In 2001, the state average for venture capital disbursed per \$1,000 GSP was \$4.06, up from \$1.05 in 1995.
- At the state level in 2001, this value ranged from a high of \$17.07 per \$1,000 GSP to no venture capital investment.
- The state distribution of venture capital was similar to that for the high-technology indicators.

Table 8-24
Venture capital disbursed per \$1,000 of GSP, by state: 1995, 1998, and 2001

State	Venture capital disbursed (thousands of dollars)			GSP (millions of dollars)			Venture capital/\$1,000 GSP		
	1995	1998	2001	1995	1998	2001	1995	1998	2001
All states.....	7,674,878	21,485,964	41,174,693	7,309,513	8,750,175	10,137,194	1.05	2.46	4.06
Alabama.....	36,501	87,240	86,697	95,514	109,672	121,490	0.38	0.80	0.71
Alaska.....	0	0	0	24,791	24,651	28,581	0.00	0.00	0.00
Arizona.....	93,416	210,540	267,150	104,586	132,897	160,687	0.89	1.58	1.66
Arkansas.....	5,012	6,900	10,400	53,809	61,298	67,913	0.09	0.11	0.15
California.....	2,803,765	8,352,209	16,613,254	925,931	1,125,331	1,359,265	3.03	7.42	12.22
Colorado.....	331,734	964,907	1,386,050	109,021	139,860	173,772	3.04	6.90	7.98
Connecticut.....	126,470	447,977	576,553	118,645	142,701	166,165	1.07	3.14	3.47
Delaware.....	4,432	0	166,130	27,575	32,693	40,509	0.16	0.00	4.10
District of Columbia.....	185	81,200	201,857	48,408	52,145	64,459	0.00	1.56	3.13
Florida.....	242,326	432,354	961,096	344,771	415,564	491,488	0.70	1.04	1.96
Georgia.....	162,982	389,938	915,043	203,505	254,891	299,874	0.80	1.53	3.05
Hawaii.....	0	4,165	37,811	37,243	39,371	43,710	0.00	0.11	0.87
Idaho.....	15,200	30,285	6,272	27,155	31,041	36,905	0.56	0.98	0.17
Illinois.....	225,333	337,617	897,765	359,451	423,175	475,541	0.63	0.80	1.89
Indiana.....	9,163	26,955	53,838	148,447	176,110	189,919	0.06	0.15	0.28
Iowa.....	14,188	10,275	6,041	71,687	83,069	90,942	0.20	0.12	0.07
Kansas.....	6,600	12,563	41,023	64,069	76,648	87,196	0.10	0.16	0.47
Kentucky.....	16,979	37,460	28,505	91,472	107,648	120,266	0.19	0.35	0.24
Louisiana.....	30,450	69,163	75,872	112,157	122,580	148,697	0.27	0.56	0.51
Maine.....	1,500	61,828	35,501	27,987	32,208	37,449	0.05	1.92	0.95
Maryland.....	118,439	324,796	953,919	139,495	164,100	195,007	0.85	1.98	4.89
Massachusetts.....	693,963	2,025,756	4,911,779	197,469	241,369	287,802	3.51	8.39	17.07
Michigan.....	73,517	115,982	103,580	254,179	293,173	320,470	0.29	0.40	0.32
Minnesota.....	163,846	375,671	542,583	131,841	163,009	188,050	1.24	2.30	2.89
Mississippi.....	2,749	3,500	40,000	54,562	61,709	67,125	0.05	0.06	0.60
Missouri.....	80,382	683,810	370,170	139,547	163,425	181,493	0.58	4.18	2.04
Montana.....	0	500	24,820	17,537	19,971	22,635	0.00	0.03	1.10
Nebraska.....	16,102	33,035	16,963	44,084	51,349	56,967	0.37	0.64	0.30
Nevada.....	575	24,741	30,450	49,377	63,786	79,220	0.01	0.39	0.38
New Hampshire.....	30,690	179,239	256,706	32,388	40,529	47,183	0.95	4.42	5.44
New Jersey.....	284,600	498,412	1,483,098	271,435	316,875	365,388	1.05	1.57	4.06
New Mexico.....	3,550	7,700	9,400	42,170	48,488	55,426	0.08	0.16	0.17
New York.....	302,597	1,311,411	2,183,533	597,593	718,686	826,488	0.51	1.82	2.64
North Carolina.....	219,485	362,780	634,547	194,634	241,220	275,615	1.13	1.50	2.30
North Dakota.....	9,835	500	1,517	14,529	17,053	19,005	0.68	0.03	0.08
Ohio.....	68,670	274,597	236,753	295,668	346,648	373,708	0.23	0.79	0.63
Oklahoma.....	6,100	6,950	24,800	69,960	82,189	93,855	0.09	0.08	0.26
Oregon.....	41,711	53,497	223,885	81,092	102,943	120,055	0.51	0.52	1.86
Pennsylvania.....	141,038	619,638	904,734	318,765	365,038	408,373	0.44	1.70	2.22
Rhode Island.....	6,020	7,900	62,089	25,703	30,838	36,939	0.23	0.26	1.68
South Carolina.....	53,385	53,923	25,980	86,880	101,384	115,204	0.61	0.53	0.23
South Dakota.....	0	0	500	18,257	20,570	24,251	0.00	0.00	0.02
Tennessee.....	175,201	124,234	107,041	136,821	162,228	182,515	1.28	0.77	0.59
Texas.....	431,854	1,078,695	3,309,362	513,882	641,405	763,874	0.84	1.68	4.33
Utah.....	11,200	116,490	222,959	46,290	59,084	70,409	0.24	1.97	3.17
Vermont.....	3,208	1,414	11,600	13,974	16,294	19,149	0.23	0.09	0.61
Virginia.....	271,620	807,401	966,573	188,963	228,049	273,070	1.44	3.54	3.54
Washington.....	329,414	755,106	1,049,591	151,265	192,031	222,950	2.18	3.93	4.71
West Virginia.....	0	0	1,650	36,315	39,024	42,368	0.00	0.00	0.04
Wisconsin.....	8,891	74,713	93,756	133,694	157,735	177,354	0.07	0.47	0.53
Wyoming.....	0	0	3,500	14,920	16,420	20,418	0.00	0.00	0.17
Puerto Rico.....	7,760	1,300	27,000	28,452	35,161	NA	0.27	0.04	NA

GSP gross state product
 NA not available

NOTES: The state total for each year is the sum of the 50 states and the District of Columbia. GSP is reported in current dollars.

SOURCES: PricewaterhouseCoopers, Venture Economics, and National Venture Capital Association, MoneyTree Survey, special tabulations; U.S. Department of Commerce, Bureau of Economic Analysis, Gross State Product data; and Government of Puerto Rico, Office of the Governor.

Technical Note: Defining High-Technology Industries

The Bureau of Labor Statistics (BLS) developed a list of high-technology industries based on Standard Industrial Classification (SIC) codes in 1999.¹ The list was based on measures of industry employment in both R&D and technology-oriented occupations, using Occupational Employment Statistics surveys from 1993 to 1995 in which employers were asked to explicitly report the number of workers engaged in R&D activity. The researchers identified 31 three-digit SIC R&D-intensive industries in which the number of R&D workers and technology-oriented occupations accounted for a proportion of employment that was at least twice the average for all industries surveyed. These industries had at least 6 R&D and 76 technology-

oriented workers per 1,000 workers. The BLS list comprised 27 manufacturing and 4 service industries.

The Office of Technology Policy, with assistance from the Bureau of the Census, converted the BLS list of SIC codes into the newer North American Industrial Classification System (NAICS) codes using the concordance between the two classification systems. The process necessitated both splitting and combining codes. The resulting list of high-technology NAICS codes comprises 39 categories that range from four- to six-digit detail. Twenty-nine categories identify manufacturing industries, and 10 identify service industries. The industry categories included in the high-technology segment are shown in table 8-25.

Table 8-25
High-technology NAICS codes

NAICS code	Industry
32411	Petroleum refineries
3251	Basic chemical manufacturing
3252	Resin, synthetic rubber, and artificial and synthetic fibers and filaments manufacturing
3253	Pesticide, fertilizer, and other agricultural chemical manufacturing
3254	Pharmaceutical and medicine manufacturing
3255	Paint, coating, and adhesive manufacturing
3256	Soap, cleaning compound, and toilet preparation manufacturing
3259	Other chemical product and preparation manufacturing
332992	Ordnance and accessories manufacturing—small arms ammunition manufacturing
332993	Ordnance and accessories manufacturing—ammunition (except small arms) manufacturing
332994	Ordnance and accessories manufacturing—small arms manufacturing
332995	Ordnance and accessories manufacturing—other ordnance and accessories manufacturing
3331	Agriculture, construction, and mining machinery manufacturing
3332	Industrial machinery manufacturing
3333	Commercial and service industry machinery manufacturing
3336	Engine, turbine, and power transmission equipment manufacturing
3339	Other general purpose machinery manufacturing
3341	Computer and peripheral equipment manufacturing
3342	Communications equipment manufacturing
3343	Audio and video equipment manufacturing
3344	Semiconductor and other electronic component manufacturing
3345	Navigational, measuring, electromedical, and control instruments manufacturing
3346	Manufacturing and reproducing magnetic and optical media
3353	Electrical equipment manufacturing
33599	All other electrical equipment and component manufacturing
3361	Motor vehicle manufacturing
3362	Motor vehicle body and trailer manufacturing
3363	Motor vehicle parts manufacturing
3364	Aerospace product and parts manufacturing
3391	Medical equipment and supplies manufacturing
5112	Software publishers
514191	On-line information services
5142	Data processing services
5413	Architectural, engineering, and related services
5415	Computer systems design and related services
5416	Management, scientific, and technical consulting services
5417	Scientific research and development services
6117	Educational support services
811212	Computer and office machine repair and maintenance

NAICS North American Industrial Classification System

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¹Hecker, D. 1999. High-technology employment: A broader view. *Monthly Labor Review* 122(6):18.