



State Government R&D Expenditures Remain Unchanged in FY 2013 at \$1.8 Billion

by Christopher Pece¹

State government agency expenditures for research and development totaled \$1.785 billion in FY 2013, virtually unchanged (down 0.6%) from the \$1.795 billion reported in FY 2012. Five state governments (California, Ohio, Texas, New York, and Florida) accounted for 57% of all state government R&D in both FY 2012 and FY 2013. This InfoBrief presents summary statistics from the FY 2012 and FY 2013 Survey of State Government R&D, sponsored by the National Science Foundation (NSF), National Center for Science and Engineering Statistics (NCSES).

These survey results provide the most recent NCSES statistics of R&D activities performed and funded by state government agencies in each of the 50 states and the governments of the District of Columbia and Puerto Rico. Survey data are available by state and by individual state agency. Further details are also available on R&D performer, source of funding, and type of R&D, such as agriculture, energy, environment and natural resources, health, transportation, and other.

National Totals

State government agency R&D expenditures for FY 2013 totaled \$1.785 billion, of which 77% came from state and other nonfederal sources (table 1). Seventy-four percent of the states' R&D expenditures went to extramural R&D performers (i.e., performers other than state agencies) in FY 2013. Academic institutions were the primary recipients of these expenditures (receiving 62% in FY 2013, excluding direct state appropriations to colleges and universities), followed by companies and individuals (28% in FY 2013). Intramural performers, the state agencies themselves, performed \$464 million of R&D in FY 2013, a 1.3% decrease from FY 2012. Of all state government R&D expenditures, 25% was devoted to basic research in FY 2013, a decline of 4.5% from FY 2012, although the share of basic research varied considerably by state.

The largest share of state agencies' R&D expenditures (38% in both FY 2012 and FY 2013) was for health-related R&D projects. R&D projects related to the environment and natural resources accounted for 21% of total

state government R&D expenditures in FY 2013, a slight increase from FY 2012. Transportation, energy, agriculture, and all other projects' shares of total R&D expenditures in FY 2013 were approximately 15%, 10%, 5%, and 10%, respectively. R&D projects related to transportation and those related to agriculture increased by 5.3% and 0.8%, respectively, from FY 2012. Energy-related R&D declined by 20.6% from FY 2012, and R&D for all other projects increased by 4.1% from FY 2012 to FY 2013.

Expenditures for R&D facilities (construction projects, major building renovations, major equipment purchases, and land and building acquisitions intended primarily for R&D use) totaled \$26.3 million in FY 2013, a 34.0% decline from the \$39.8 million reported in FY 2012.

State Government Shares of R&D

Individual state government expenditures on R&D (including funds originally from federal, state, and other sources) in FY 2013 varied widely, ranging from just under \$2 million in

TABLE 1. State agency R&D and R&D facilities expenditures: FYs 2012–13

(Thousands of current dollars)

Characteristic	FY 2012	FY 2013	% change
All R&D and R&D facilities expenditures	1,834,946	1,811,292	-1.3
All R&D facilities expenditures	39,787	26,252	-34.0
All R&D expenditures	1,795,159	1,785,039	-0.6
Source of funds			
Federal government	433,418	416,092	-4.0
State government and other nonfederal sources	1,361,741	1,368,948	0.5
Performer			
Intramural ^a	470,517	464,434	-1.3
Extramural	1,324,642	1,320,605	-0.3
Academic institutions	766,333	813,830	6.2
Companies and individuals	390,920	363,226	-7.1
Other	167,389	143,549	-14.2
Basic research	467,581	446,578	-4.5
Applied research and development	1,327,578	1,338,461	0.8
Type of R&D project			
Agriculture	96,579	97,316	0.8
Energy	230,394	182,880	-20.6
Environment and natural resources	357,528	379,645	6.2
Health	689,781	683,933	-0.8
Transportation	252,070	265,514	5.3
Other ^b	168,807	175,751	4.1

^a Intramural performers include employees within the same state department or agency and services performed by others in support of internal R&D projects.

^b Includes government functions for corrections, criminal justice, education, forensic sciences, labor, public safety, and social services.

NOTES: Puerto Rico is not included in U.S. totals due to its classification as a U.S. territory. Detail may not add to total because of rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, FY 2012 and FY 2013 Survey of State Government R&D.

several states to over \$346 million in California (table 2). Combined, the five largest state governments in terms of total R&D expenditures (California, Ohio, Texas, New York, and Florida) received 29% of the \$416 million federal R&D support provided to all state governments.

Six states accounted for 56% of all state agencies' intramural R&D performance (\$464 million) in FY 2013 (table 2): New York (\$74 million), California (\$57 million), Florida (\$47 million), South Carolina (\$37 million), Connecticut (\$26 million), and North Carolina (\$21 million). In FY 2013 nearly 40% (\$186

million) of state agency intramural R&D performance was funded by the federal government. States with the largest share of federal support for their intramural R&D include Tennessee (97%), Indiana (90%), Oklahoma (89%), Idaho (81%), and Rhode Island (80%), whereas state government agencies in Nebraska received no federal funding to support their intramural R&D performance.

Five states accounted for 62% of funding for extramural R&D performance (\$1.321 billion) (table 2): California (\$290 million), Ohio (\$186 million), Texas (\$173 million), New

York (\$103 million), and Florida (\$71 million). However, states varied in how they funded extramural R&D. For example, California state agencies directed the majority of this funding toward academic institutions (\$182 million, or 63%), but Ohio state agencies directed the bulk of this funding toward companies and individuals (\$175 million, or 94%). In addition to California, state agencies in Texas (\$160 million), New York, (\$64 million), Florida (\$40 million), Pennsylvania (\$36 million), and Utah (\$35 million) combined accounted for 63% of the total support to academic institutions in FY 2013. Similarly, in addition to Ohio, state agencies in California (\$42 million), Florida (\$24 million), New York (\$21 million), Pennsylvania (\$13 million), and Texas (\$12 million) combined accounted for 79% of the total R&D support from state governments to companies and individuals (\$363 million) in FY 2013.

R&D by State Agency Functions

Most states reported a broad mix of R&D projects related to state government functions: agriculture, energy, environment and natural resources, health, transportation, and other (table 3). All states reported R&D expenditures in at least two of these R&D functional categories, and 13 states reported R&D expenditures across all R&D functions. However, some of these R&D functions are highly concentrated within a handful of states. For example, in FY 2013, a total of 32 states reported some expenditures for energy-related R&D, yet 81% of all state government expenditures for energy-related R&D were concentrated in California (\$56 million), Ohio (\$52 million), New York (\$27 million), Arizona (\$8 million), and Iowa (\$6 million). Similarly, 28 states reported expenditures for health-related R&D. However, 71% of all state government expenditures on health-related R&D projects were confined to

TABLE 2. State agency expenditures for R&D, by state and performer: FY 2013
(Thousands of current dollars)

State	All R&D			Intramural performers ^a			Extramural performers ^b			State	All R&D			Intramural performers ^a			Extramural performers ^b		
	expenditures	Amount	Percent	Amount	Percent	Amount	Percent	expenditures	Amount		Percent	Amount	Percent	Amount	Percent	Amount	Percent		
United States ^c	1,785,039	464,434	26.0	1,320,605	74.0			Missouri	13,051	6,697	51.3	6,355	48.7						
Alabama	13,293	9,161	68.9	4,132	31.1			Montana	6,570	2,035	31.0	4,535	69.0						
Alaska	6,689	5,963	89.1	726	10.9			Nebraska	7,274	368	5.1	6,906	94.9						
Arizona	27,811	16,142	58.0	11,669	42.0			Nevada	1,641	367	22.4	1,274	77.6						
Arkansas	16,519	2,992	18.1	13,527	81.9			New Hampshire	1,788	684	38.3	1,105	61.8						
California	346,942	57,262	16.5	289,680	83.5			New Jersey	22,414	2,921	13.0	19,493	88.3						
Colorado	14,472	8,249	57.0	6,223	43.0			New Mexico	2,016	769	38.1	1,247	61.9						
Connecticut	41,023	25,613	62.4	15,411	37.6			New York	177,063	73,922	41.7	103,141	58.3						
Delaware	4,729	2,515	53.2	2,215	46.8			North Carolina	30,650	20,501	66.9	10,149	33.1						
District of Columbia	1,849	436	23.6	1,413	76.4			North Dakota	7,364	430	5.8	6,935	94.2						
Florida	118,781	47,373	39.9	71,408	60.1			Ohio	188,312	2,041	1.1	186,271	98.9						
Georgia	12,698	2,041	16.1	10,657	83.9			Oklahoma	28,225	1,075	3.8	27,150	96.2						
Hawaii	13,095	4,321	33.0	8,774	67.0			Oregon	23,084	19,525	84.6	3,559	15.4						
Idaho	12,929	7,836	60.6	5,093	39.4			Pennsylvania	66,429	6,675	10.0	59,754	90.0						
Illinois	17,999	1,663	9.2	16,336	90.8			Rhode Island	1,641	225	13.7	1,416	86.3						
Indiana	10,167	1,022	10.1	9,145	89.9			South Carolina	47,732	37,004	78.0	10,728	22.6						
Iowa	19,365	5,603	28.9	13,762	71.1			South Dakota	3,661	114	3.1	3,546	96.9						
Kansas	5,708	1,578	27.6	4,131	72.4			Tennessee	3,430	785	22.9	2,646	77.1						
Kentucky	19,751	2,963	15.0	16,788	85.0			Texas	185,200	11,746	6.3	173,453	93.7						
Louisiana	15,713	5,081	32.3	10,632	67.7			Utah	53,637	17,980	33.5	35,657	66.5						
Maine	6,110	1,154	18.9	4,956	81.1			Vermont	1,828	1,160	63.5	667	36.9						
Maryland	29,467	572	1.9	28,895	98.1			Virginia	25,918	13,046	50.3	12,871	49.7						
Massachusetts	4,590	1,083	23.6	3,507	76.4			Washington	47,123	12,820	27.2	34,303	72.8						
Michigan	12,830	2,651	20.7	10,179	79.3			West Virginia	19,028	4,764	25.0	14,263	75.0						
Minnesota	14,856	1,007	6.8	13,849	93.2			Wisconsin	21,212	7,403	34.9	13,810	65.1						
Mississippi	4,863	2,095	43.1	2,769	56.9			Wyoming	6,497	3,001	46.2	3,496	53.8						
								Puerto Rico ^d	7,950	6,084	76.5	1,866	23.5						

^a Intramural performers include employees within the same state department or agency and services performed by others in support of internal R&D projects.

^b Extramural performers include academic institutions, companies and individuals, and other non-internal performers.

^c U.S. total reflects all 50 states and the District of Columbia.

^d Puerto Rico is not included in U.S. total due to its classification as a U.S. territory.

NOTE: Detail may not add to total because of rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, FY 2012 and FY 2013 Survey of State Government R&D.

agencies in California (\$217 million), Texas (\$155 million), New York (\$66 million), Pennsylvania (\$44 million), and Florida (\$39 million).

The top five state governments with expenditures for agriculture, environmental and natural resources, and transportation were somewhat less concentrated in their shares of the respective national totals. For instance, 37 states reported some R&D expenditures for agriculture, but the five largest states, namely, Florida (\$19 million), North Carolina (\$18 million),

Washington (\$9 million), Arkansas (\$9 million), and California (\$5 million) constitute 61% of all state government spending on agriculture-related R&D. In the case of environment and natural resources, 46 states reported some R&D expenditures, with Florida (\$47 million), Ohio (\$38 million), South Carolina (\$36 million), California (\$31 million), and New York (\$23 million) constituting about 46% of the total. Transportation-related R&D projects were conducted by all state governments except for Massachusetts, with California (\$35 million), Ohio (\$22

million), Texas (\$21 million), Virginia (\$14 million), and New York (\$13 million) accounting for 39% of total transportation-related R&D expenditures.

Data Sources and Limitations

Data presented in this InfoBrief are in current dollars and have not been adjusted for inflation. All 50 states, the District of Columbia, and Puerto Rico participated in the FY 2012 and FY 2013 survey, and 365 of the 366 selected agencies (99.7%) responded

to the survey. Data for the FY 2012 and FY 2013 survey were collected for NCSSES by the U.S. Census Bureau under an interagency agreement.

Most states and the territory of Puerto Rico have a fiscal year period that begins on 1 July and ends the following 30 June. For example, FY 2013 begins on 1 July 2012 and ends on 30 June 2013. There are, however, five exceptions to the June 30 fiscal year end: New York (ends 31 March), Texas (ends 31 August), Alabama, Michigan, and the District of Columbia (ends 30 September). For comparability, all states and the territory of Puerto Rico are surveyed at the same time and report for their own fiscal year end; no adjustments are made to account for different reported fiscal year end dates.

Use of terms such as state, state government, and state agencies have equivalent meaning and are used interchangeably throughout this report. The amounts reported here are for R&D expenditures of state government departments, agencies, public authorities, institutions, and other dependent entities that operate separately or somewhat autonomously from the central state government. State government R&D totals can display considerable volatility between survey years due to several national and state-specific factors. Large changes are not unusual, especially for discretionary spending items such as R&D. Amounts reported do not include direct appropriations from state legislatures to universities, colleges, and private organizations. As a result, the \$766 million in FY 2012 expenditures reported by state agencies to support R&D performance by academic institutions differs from the figure reported by universities

TABLE 3. State agency expenditures for R&D, by state and function of R&D, for the 10 states with the highest levels of R&D expenditures: FY 2013
(Thousands of current dollars)

State	Total	Agriculture	Energy	Environment and natural resources	Health	Transportation	Other
United States ^a	1,785,039	97,316	182,880	379,645	683,933	265,541	175,751
California	346,942	5,040	55,577	30,615	217,140	35,038	3,532
Ohio	188,312	0	52,267	38,074	9,040	22,036	66,895
Texas	185,200	2,651	447	6,429	155,001	20,671	0
New York	177,063	1,383	27,061	23,233	65,677	12,838	46,870
Florida	118,781	19,047	990	47,463	38,776	10,301	2,205
Pennsylvania	66,429	2,033	1,700	9,070	44,056	3,843	5,728
Utah	53,637	3,989	4,559	18,313	24,346	2,430	0
South Carolina	47,732	158	251	36,316	1,176	1,943	7,888
Washington	47,123	8,955	0	10,953	19,587	4,258	3,371
Connecticut	41,023	3,315	589	13,781	19,239	4,100	0
All others	512,797	50,745	39,439	145,398	89,895	148,083	39,262
Puerto Rico ^b	7,950	649	220	245	5,696	200	940

^a U.S. total reflects all 50 states and the District of Columbia.

^b Puerto Rico is not included in U.S. total due to its classification as a U.S. territory.

NOTES: Includes state agency funding from all sources for both intramural and extramural performance. Detail may not add to total because of rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, FY 2012 and FY 2013 Survey of State Government R&D.

and colleges in FY 2012 (\$3.7 billion) for expenditures on R&D activities that were funded from state and local government sources. (See National Science Foundation, National Center for Science and Engineering Statistics, 2012. *Higher Education Research and Development: Fiscal Year 2012*. Data Tables, March 12, 2014. Available at <http://ncesdata.nsf.gov/herd/2012/>.)

State-specific data not available in these InfoBrief tables will be available in the full set of detailed tables from this survey in the report *State Government Research and Develop-*

ment: Fiscal Year 2012 and FY 2013, at <http://www.nsf.gov/statistics/staterd/>. Individual detailed tables from the FY 2012 and FY 2013 survey may be available in advance of the full report. For further information, contact the author.

Notes

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