



Federal Science and Engineering Obligations to Universities and Colleges Declined 2% in FY 2015

by Michael Yamaner¹

In FY 2015, federal agencies obligated \$30.5 billion to 1,016 academic institutions for science and engineering (S&E) activities. This represents a 2% decrease in current dollars from the \$31.1 billion obligated to 1,003 academic institutions in FY 2014.

These statistics are from the Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions (Federal S&E Support Survey) from the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF).

After adjusting for inflation, federal S&E obligations to academic institutions decreased \$0.9 billion (3%) between FY 2014 and FY 2015, following a \$1.1 billion increase (4%) from FY 2013 to FY 2014 (table 1). For the remainder of this InfoBrief, unless otherwise noted, amounts for FY 2015 obligations and comparisons with previous years are in current dollars.

Categories of Academic S&E Support

Federal academic S&E obligations include six categories: research and

development (R&D) (89% of total annual federal academic S&E obligations over the past 4 years); R&D plant; facilities and equipment for instruction in S&E; fellowships, traineeships, and training grants; general support for S&E; and other S&E activities (table 1).

Federal academic R&D obligations decreased \$0.6 billion (2%) between FY 2014 and FY 2015. Four of the five remaining categories also showed decreased funding in FY 2015. R&D plant had the second largest decrease (\$29 million, or 7%), followed by S&E

TABLE 1. Federal academic science and engineering obligations, by activity: FYs 2012–15

Fiscal year	All federal obligations	Research and development	R&D plant	Facilities and equipment for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
Current \$millions							
2012	31,003	27,495	434	4	914	142	2,015
2013	29,353	26,106	271	4	893	132	1,948
2014	31,095	27,591	400	11	1,340	138	1,616
2015	30,494	27,041	371	4	1,348	136	1,594
Constant FY 2009 \$millions							
2012	29,580	26,233	414	4	872	135	1,923
2013	27,533	24,487	254	4	838	124	1,827
2014	28,677	25,446	369	10	1,236	127	1,490
2015	27,747	24,605	338	4	1,227	124	1,450

NOTES: Gross domestic product implicit price deflators were used to convert current to constant dollars. Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

activities (\$22 million, or 1%). Fellowships, traineeships, and training grants showed the only increase (\$8 million, or 1%) in FY 2015 (table 1).

Agency Sources for Academic S&E Support

Collectively, the Department of Health and Human Services (HHS), NSF, and the Department of Defense (DOD) provided 85% of all federally funded academic S&E obligations in FY 2015. Of these agencies, HHS accounted for 56% of all federally funded obligations; NSF, 17%; and DOD, 11%. The Department of Agriculture (USDA), the Department of Energy (DOE), and the National Aeronautics and Space Administration (NASA) provided most of the remaining academic S&E total (13%). Three of six of the largest academic S&E funding agencies (HHS, DOD, and DOE) decreased obligations between FY 2014 and FY 2015, with HHS reporting the largest decrease (\$0.5 billion, or 3%). By contrast, NSF, USDA, and NASA increased obligations in FY 2015, led by NSF's \$0.2 billion (4%) (table 2).

University Shares of Academic S&E Support

The Johns Hopkins University (including its Applied Physics Laboratory) continued to be the leading academic recipient of federal S&E obligations, with \$1.6 billion in FY 2015. DOD provided Johns Hopkins with the largest share of federal S&E funds (45% of Johns Hopkins' FY 2015 total). The top 20 university recipients of federal academic S&E obligations accounted for 36% of the FY 2015 federal total. Of these universities, 19 were also ranked among the top 20 recipients in FY 2014. In FY 2015, Cornell University's rank fell from 20th to 25th and the Massachusetts Institute of Technology's rank rose from 21st to 20th (table 3).

TABLE 2. Federal academic S&E obligations, by agency in FY 2015 rank order: FYs 2012–15

Fiscal year	All agencies							Other agencies ^a
	HHS	NSF	DOD	USDA	DOE	NASA		
Current \$millions								
2012	31,003	17,939	5,181	3,653	1,221	1,037	984	989
2013	29,353	16,881	5,023	3,384	1,136	1,077	1,004	848
2014	31,095	17,517	5,092	3,714	1,301	1,527	1,087	857
2015	30,494	17,008	5,295	3,501	1,424	1,272	1,135	859
Constant FY 2009 \$millions								
2012	29,580	17,116	4,943	3,485	1,165	989	939	944
2013	27,533	15,834	4,712	3,174	1,066	1,010	942	795
2014	28,677	16,155	4,696	3,425	1,200	1,408	1,002	790
2015	27,747	15,476	4,818	3,186	1,296	1,157	1,033	782

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

^a Includes data for the following agencies: the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, Interior, and Transportation; the Agency for International Development; the Environmental Protection Agency; the Appalachian Regional Commission; the Nuclear Regulatory Commission; the Office of Justice Programs (part of the Department of Justice); and the Social Security Administration.

NOTES: Gross domestic product implicit price deflators were used to convert current to constant dollars. Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

Federal S&E Support to Minority-Serving Academic Institutions

NCSES's Federal S&E Support Survey also tracks obligations to three categories of minority-serving institutions (MSIs):² historically black colleges and universities (HBCUs),³ high-Hispanic-enrollment (HHE)⁴ institutions, and tribal colleges and universities.⁵

S&E obligations to MSIs were \$783 million, 3% of the total \$30.5 billion in S&E obligations to universities and colleges in FY 2015. Between FY 2014 and FY 2015, obligations to MSIs increased by 1% (\$11.5 million), the third straight yearly increase. R&D annually has accounted for between 63% and 69% of total S&E obligations to MSIs from FY 2012 through FY 2015.

The top 20 MSIs ranked by federal academic S&E support accounted for 56% of the academic S&E total for MSIs in FY 2015. New Mexico State University, an HHE, was the leading MSI recipient of federal S&E obligations, receiving \$48.8 million in FY 2015, of which 84% was for R&D (table 4). New Mexico State University received 62% of its S&E total from three agencies: DOD (\$11.6 million), NSF (\$9.6 million), and NASA (\$9.0 million).

Federal S&E Support to Nonprofit Institutions

NCSES collects statistics on federal obligations to independent nonprofit institutions for two of the six S&E categories: R&D and R&D plant. During FY 2015 federal agencies obligated \$5.8 billion to 1,024 nonprofit institutions,

TABLE 3. Federal academic science and engineering obligations to the 20 universities and colleges receiving the largest amounts, by agency: FY 2015
(Thousands of dollars)

Institution	All federal obligations	HHS	NSF	DOD	USDA	DOE	NASA	Other agencies ^a
All institutions	30,493,591	17,008,320	5,294,676	3,500,899	1,424,454	1,271,809	1,134,545	858,889
Top 20 institutions	10,911,483	7,145,020	1,128,256	1,572,500	121,277	347,534	423,592	173,304
Johns Hopkins U. ^b	1,552,227	593,597	31,950	706,151	0	4,970	212,130	3,429
U. Washington	659,587	437,415	86,765	66,239	11,180	17,295	11,880	28,812
U. Michigan	646,673	447,944	82,650	50,604	1,843	24,337	20,973	18,322
U. California, San Diego	584,261	371,358	92,822	68,373	722	18,108	9,685	23,193
U. California, San Francisco	571,144	545,331	5,005	19,973	0	0	835	0
U. Pennsylvania	547,172	442,976	44,029	48,103	1,184	7,743	2,671	465
Stanford U.	540,336	401,842	56,522	55,725	0	8,711	12,647	4,889
Columbia U. in the City of New York	515,509	362,343	91,420	27,526	0	10,548	19,045	4,626
U. California, Los Angeles	510,426	370,466	69,708	33,112	36	20,614	14,958	1,532
U. Pittsburgh	494,697	424,835	22,777	39,401	0	5,776	584	1,325
Harvard U.	463,310	343,235	53,896	47,119	0	9,808	6,283	2,970
Duke U.	463,109	368,305	41,725	33,672	100	14,422	2,959	1,927
U. Colorado Boulder	460,851	235,876	74,357	38,247	202	12,372	50,287	49,509
U. Wisconsin-Madison	447,256	264,545	79,868	17,314	31,894	49,701	0	3,934
U. North Carolina, Chapel Hill	440,480	386,114	24,994	12,345	0	7,239	703	9,085
Washington U., Saint Louis	422,773	373,506	17,357	16,620	0	8,603	6,688	0
U. Minnesota	407,741	246,927	87,257	13,612	39,097	11,715	3,962	5,171
Yale U.	405,153	337,239	32,253	23,451	30	9,722	2,078	380
Pennsylvania State U.	404,717	100,730	64,199	159,415	34,989	30,712	7,740	6,932
Massachusetts Institute of Technology	374,062	90,434	68,701	95,499	0	75,139	37,486	6,804
All other academic institutions	19,582,109	9,863,300	4,166,420	1,928,398	1,303,177	924,275	710,953	685,586

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

^a Includes data for the following agencies: the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, Interior, and Transportation; the Agency for International Development; the Environmental Protection Agency; the Appalachian Regional Commission; the Nuclear Regulatory Commission; the Office of Justice Programs (part of the Department of Justice); and the Social Security Administration.

^b Includes funding for Applied Physics Laboratory.

NOTE: Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2015.

a 5% decrease from the \$6.1 billion reported in FY 2014. Massachusetts General Hospital received the most federal R&D and R&D plant funds (\$349 million) among nonprofits in FY 2015, with HHS providing 97% of this funding (table 5).

In FY 2015, the 10 leading nonprofit institutions for federal S&E funding received 35% of the total funds to all nonprofits. Eight of these recipients were hospitals or medical research institutes, and six also ranked among the top 10 in the prior year.

Four nonprofits moved into the top 10 in FY 2015, Boston Children's Hospital (7th in FY 2015, up from 11th in FY 2014), the Dana-Farber Cancer Institute (8th, up from 12th), Children's Hospital of Philadelphia (9th, up from 13th), and Beth Israel Deaconess Medical Center, Boston (10th, up from 15th). Three nonprofits fell out of the top 10 and one was reclassified, RAND Corporation (29th in FY 2015, down from 7th in FY 2014), Broad Institute (12th, down from 9th) and the Henry M. Jackson Foundation for the Advancement of Military Medicine (16th,

down from 10th) (table 5). The Association of Universities for Research in Astronomy (ranked 6th among nonprofit institutions receiving federal S&E funding in FY 2014) has been reclassified as an academic consortium.

Data Sources, Limitations, and Availability

Gross domestic product implicit price deflators were used to convert current to constant dollars in this InfoBrief. Data presented herein were obtained from the 20 agencies (12 federal departments and 8 independent agencies) that

TABLE 4. Federal obligations for science and engineering to minority-serving institutions, ranked by total amount received in FY 2015: FYs 2012–15
(Thousands of dollars)

Rank	Institution	2012		2013		2014		2015	
		All federal obligations	R&D	All federal obligations	R&D	All federal obligations	R&D	All federal obligations	R&D
	All minority-serving institutions	673,791	424,700	720,406	468,697	771,796	514,866	783,312	539,381
1	New Mexico State U.	na	na	78,835	70,022	87,644	75,235	48,786	40,952
2	Florida International U.	36,231	32,997	35,296	30,770	35,138	30,301	45,340	36,962
3	Morehouse School of Medicine	28,223	23,001	29,445	23,583	33,244	27,587	30,298	24,988
4	U. Texas, El Paso	27,739	18,430	23,111	16,879	25,080	20,011	29,669	22,265
5	North Carolina Agricultural and Technical State U.	26,688	15,811	24,762	14,811	27,490	19,689	29,380	18,471
6	U. Puerto Rico, Medical Sciences Campus	26,449	26,449	29,571	28,083	25,835	25,774	25,970	25,149
7	U. Texas, San Antonio	23,053	20,084	20,505	16,802	20,940	18,715	23,322	21,479
8	CUNY, City C.	25,542	22,752	22,957	22,005	29,241	27,219	22,430	20,334
9	U. Puerto Rico, Mayaguez	20,170	8,156	18,749	8,299	24,253	11,798	20,861	10,347
10	Howard U.	23,797	15,437	20,348	11,635	22,022	14,743	20,144	14,746
11	Florida A&M U.	15,431	7,433	16,545	10,478	17,421	11,692	19,495	13,104
12	Prairie View A&M U.	14,975	7,288	13,909	7,769	13,931	6,766	17,139	12,239
13	Tennessee State U.	12,194	6,855	13,824	6,886	18,570	6,014	15,681	8,454
14	Meharry Medical C.	24,872	18,703	20,659	15,202	16,991	11,053	15,087	9,383
15	Hampton U.	9,858	7,280	11,800	9,012	11,479	10,028	15,009	12,207
16	Alabama A&M U.	14,603	7,103	11,381	6,007	10,780	4,436	13,987	9,642
17	U. Texas Rio Grande Valley	10,419	7,716	9,866	5,083	8,696	4,707	13,516	9,706
18	Tuskegee U.	19,754	15,118	18,850	10,846	17,831	10,465	12,592	7,213
19	Jackson State U.	13,395	8,353	14,776	12,209	10,882	6,775	12,163	9,454
20	U. of the District of Columbia	5,634	2,597	3,887	1,257	4,020	1,029	11,662	2,326
	All other minority-serving institutions	294,764	153,140	281,329	141,060	310,310	170,832	340,781	209,960

na = not applicable; New Mexico State U. did not meet the requirements of a "minority-serving institution" that year.

NOTES: Because of rounding, detail may not add to totals. This list of minority institutions is based on the definition of "minority institution" found in the Higher Education Act (20 U.S.C. 1067k(3)) and on fall 2014 enrollment data self-reported by the institutions in the Integrated Postsecondary Education Data System (IPEDS) survey conducted by the National Center for Education Statistics (NCES). NCES has determined that each academic institution on this list reported an enrollment of a single minority group or a combination of those minority groups that exceeded 50% of its total enrollment. Minority is defined as American Indian or Alaska Native, black (not of Hispanic origin), and Hispanic. This list excludes Asians or Pacific Islanders (IPEDS enrollment data do not disaggregate Pacific Islanders from Asians, although Pacific Islanders are a minority) because Asians are not considered a minority under this program and because studies show that they are not underrepresented in science and engineering.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

made S&E obligations to academic and nonprofit institutions in FY 2015, as reported to the Federal S&E Support Survey. The survey collects federal S&E support data by funding agency, institution, type of activity, type of institution, and geographic location.

The six funding categories of federal S&E support are defined as follows:

- *Research and development* includes all direct, indirect, incidental, or related costs resulting from or necessary to perform R&D by private individuals and organizations under grant, contract, or cooperative agreement.

- *R&D plant* includes all projects whose principal purpose is to provide support for construction, acquisition, renovation, modification, repair, or rental of facilities, land, works, or fixed equipment for use in scientific or engineering R&D.

- *Facilities and equipment for S&E instruction* includes all programs whose principal purpose is to provide support for construction, acquisition, renovation, modification, repair, or rental of facilities, land, works, or equipment for use in instruction in S&E.

- *Fellowships, traineeships, and training grants* includes all fellowship, traineeship, and training grant programs that are directed primarily toward the development and maintenance of the scientific workforce.
- *General support for S&E* includes funds used for scientific projects and support for activities within a specified discipline; explicit purpose is not specified.
- *Other S&E activities* includes all academic S&E obligations that cannot be assigned elsewhere and activities in support of technical conferences, teacher institutes, and programs aimed

TABLE 5. Federal research and development and R&D plant obligations to the 10 independent nonprofit institutions receiving the largest amounts, by agency: FY 2015
(Thousands of dollars)

Institution	All federal obligations	HHS	DOD	NSF	NASA	DOE	Other agencies ^a
All nonprofit institutions	5,756,745	4,077,493	730,422	314,187	235,126	142,406	257,112
Top 10 nonprofit institutions	1,997,323	1,679,420	256,054	32,947	1,156	24,987	2,760
Massachusetts General Hospital	348,970	338,944	7,157	2,639	230	0	0
Brigham and Women's Hospital	320,660	319,129	724	0	806	0	0
Mayo Clinic	238,868	233,435	5,073	361	0	0	0
Fred Hutchinson Cancer Research Center	232,509	232,091	320	99	0	0	0
Battelle Memorial Institute, all locations	213,463	29,311	163,476	5	120	18,643	1,909
SRI International	157,427	48,712	74,733	26,837	0	6,345	801
Boston Children's Hospital	133,821	130,693	2,572	557	0	0	0
Dana-Farber Cancer Institute	123,760	121,809	1,651	300	0	0	0
Children's Hospital of Philadelphia	117,838	115,893	0	1,895	0	0	50
Beth Israel Deaconess Medical Center, Boston	110,007	109,404	348	255	0	0	0
All other nonprofit institutions	3,759,423	2,398,074	474,368	281,239	233,970	117,419	254,353

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation.

^a Includes data for the following agencies: the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, Interior, Labor, and Transportation; the Agency for International Development; the Environmental Protection Agency; the Appalachian Regional Commission; the Nuclear Regulatory Commission; the Office of Justice Programs (part of the Department of Justice); and the Social Security Administration.

NOTE: Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2015.

at increasing precollege and undergraduate students' scientific knowledge.

The full set of detailed statistical tables on the FY 2015 Federal S&E Support Survey will be available online at <https://www.nsf.gov/statistics/fedsupport/>. Individual tables may be available in advance of the full report. For more information, please contact the author.

Notes

1. Michael Yamaner, National Center for Science and Engineering Statistics, National Science Foundation, 4201 Wilson Boulevard, Suite 965, Arlington, VA 22230 (myamaner@nsf.gov; 703-292-7815).

2. The list of minority institutions is based on the definition of "minority institution" found in the Higher Education Act (20 U.S.C. 1067k(3)) and on enrollment data for a given year from the Integrated Postsecondary Education Data System (IPEDS) collected

by the National Center for Education Statistics (NCES). NCES determines that each academic institution on the list reported an enrollment of a single minority group or a combination of those minority groups that exceeded 50% of its total enrollment. Minority is defined as American Indian or Alaska Native, black (not of Hispanic origin), and Hispanic. Asians or Pacific Islanders (IPEDS enrollment data do not disaggregate Pacific Islanders from Asians, although Pacific Islanders are a minority) are not considered a minority under this program.

3. The Higher Education Act of 1965, as amended, defines an HBCU as "any historically black college or university that was established prior to 1964, whose principal mission was, and is, the education of black Americans, and that is accredited by a nationally recognized accrediting agency or association determined by the Secretary (of

Education) to be a reliable authority as to the quality of training offered or is, according to such an agency or association, making reasonable progress toward accreditation" (see <https://sites.ed.gov/whhbcu/one-hundred-and-five-historically-black-colleges-and-universities/>).

4. Institutions are identified as having *high Hispanic enrollment* for this report based on fall 2014 enrollment. They are institutions whose full-time-equivalent (FTE) fall enrollment of undergraduate students is at least 25% Hispanic in a given year. The fall enrollment data are self-reported by the institutions to the Integrated Postsecondary Education Data System survey conducted by the National Center for Education Statistics. The exact number and identification of HHE institutions can vary from year to year.

An HHE institution is not necessarily a *Hispanic-serving institution (HSI)*. HSIs

are eligible institutions that have recently received grants from the Department of Education's HSI program, authorized by Title V of the Higher Education Act of 1965, as amended. In 2014, eligibility for the HSI program was defined as being open to nonprofit institutions with at least 25% Hispanic FTE undergraduate enrollment, and at least 50% of the Hispanic enrollment had to be low income. The Third Higher Education

Extension Act of 2006 removed the low-income criterion for defining eligibility for the HSI program.

University of New Mexico's Gallup, Los Alamos, and Taos campuses are not HHE institutions; data for these campuses are therefore excluded from the total.

5. The list of tribal colleges and universities is from the White House Initia-

tive on American Indian and Alaska Native Education (see <https://sites.ed.gov/whiaiane/tribes-tcus/tribal-colleges-and-universities/>). Tribal colleges and universities are designated in section 2 of the Tribally Controlled College or University Assistance Act of 1978.

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