



ARRA Provided \$5.9 Billion in Federal Science and Engineering Obligations to Universities and Colleges in FY 2009

by Michael Yamaner¹

Funding provided by the American Recovery and Reinvestment Act of 2009 (ARRA) increased current-dollar federal obligations to academic institutions for science and engineering (S&E) activities by \$5.9 billion in FY 2009. ARRA funding accounted for 16.2% of the \$36.2 billion obligated to 1,447 academic institutions. This total

represents a 27.2% increase in current dollars over FY 2008.

Total inflation-adjusted (or constant) federal obligations rose to \$32.8 billion between FY 2008 and FY 2009.

Excluding the funding provided by ARRA, federal support for science and engineering to academic institu-

tions increased by \$1.4 billion (5.2%) over the same time period. This is the only constant-dollar increase in obligations between FY 2005 and FY 2009 (table 1).

These data are the most recent statistics from the National Science Foundation (NSF) Survey of Federal Science and

TABLE 1. Federal academic S&E obligations, by activity: FY 2005–09

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	
	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA
	Current \$millions													
2005	na	28,042	na	24,684	na	422	na	40	na	1,046	na	389	na	1,462
2006	na	28,265	na	24,992	na	309	na	17	na	1,037	na	323	na	1,588
2007	na	28,182	na	24,998	na	279	na	13	na	1,101	na	222	na	1,569
2008	na	28,425	na	25,482	na	275	na	4	na	862	na	300	na	1,502
2009	5,868	30,300	5,201	27,221	404	386	0	5	22	873	45	197	194	1,618
Constant 2005 \$millions														
2005	na	28,042	na	24,684	na	422	na	40	na	1,046	na	389	na	1,462
2006	na	27,330	na	24,166	na	299	na	16	na	1,003	na	312	na	1,535
2007	na	26,452	na	23,463	na	262	na	12	na	1,033	na	208	na	1,473
2008	na	26,083	na	23,382	na	252	na	4	na	791	na	275	na	1,378
2009	5,314	27,438	4,710	24,650	366	350	0	5	20	791	41	178	176	1,465

na = not applicable.

ARRA = American Recovery and Reinvestment Act of 2009; S&E = science and engineering.

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.

Engineering Support to Universities, Colleges, and Nonprofit Institutions.

Categories of Academic S&E Support

Federal academic S&E obligations include six categories: research and development (88%–90% annually of total federal academic S&E obligations over the past 5 years); R&D plant; facilities and equipment for instruction in S&E; fellowships, traineeships, and training grants (FTTGs); general support for S&E; and other S&E activities (table 1).

Federal academic R&D obligations reached \$32.4 billion in FY 2009 with \$5.2 billion coming from ARRA funds, a 27.2% current-dollar increase (25.6% in constant dollars) over the prior year. Excluding ARRA funding, federal

academic R&D obligations showed a 6.8% increase over FY 2008 in current dollars (5.4% in constant dollars).

Federal obligations for general support for S&E fell by 19.3% in current dollars between FY 2008 and FY 2009 to \$242 million (table 1).

Each of the four remaining S&E categories showed increased current-dollar funding levels in FY 2009 compared with FY 2008. The largest gain was \$515 million (187.3%) in funding for R&D plant projects, of which most—\$404 million (78.4%)—was from ARRA funds (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 86.5% of all federal and 90.2% of ARRA-funded academic S&E obligations in FY 2009. Of these agencies, HHS accounted for 58.8% of all federal and 53.8% of ARRA-funded obligations (current dollars); NSF, 18.9% of all federal and 36.3% of ARRA-funded obligations; and DOD, 8.8% of all federal and 0.1% of ARRA-funded obligations. The Department of Agriculture, Department of Energy, and the National Aeronautics and Space Administration provided most of the remaining academic S&E total (10.3% of all federal and 8.8% of ARRA-funded obligations). Even without the additional funds provided by ARRA, all six agencies showed increased constant-dollar levels for academic S&E in FY 2009 (table 2).

TABLE 2. Federal academic S&E obligations, by agency in FY 2009 rank order: FY 2005–09

Fiscal year	All agencies		HHS		NSF		DOD		DOE		USDA		NASA ^a		Other ^b	
	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA	ARRA	Non-ARRA
Current \$millions																
2005	na	28,042	na	17,216	na	3,950	na	2,396	na	940	na	1,229	na	1,091	na	1,221
2006	na	28,265	na	17,163	na	4,099	na	2,570	na	902	na	1,263	na	975	na	1,293
2007	na	28,182	na	17,527	na	4,210	na	2,820	na	814	na	1,253	na	553	na	1,005
2008	na	28,425	na	17,180	na	4,404	na	2,823	na	1,089	na	1,251	na	673	na	1,003
2009	5,868	30,300	3,155	18,107	2,132	4,697	5	3,174	504	1,172	0	1,302	11	721	60	1,128
Constant 2005 \$millions																
2005	na	28,042	na	17,216	na	3,950	na	2,396	na	940	na	1,229	na	1,091	na	1,221
2006	na	27,330	na	16,595	na	3,963	na	2,485	na	872	na	1,221	na	943	na	1,250
2007	na	26,452	na	16,451	na	3,952	na	2,647	na	764	na	1,176	na	519	na	943
2008	na	26,083	na	15,764	na	4,041	na	2,590	na	999	na	1,148	na	618	na	920
2009	5,314	27,438	2,857	16,397	1,931	4,253	5	2,874	456	1,061	0	1,179	10	653	54	1,021

na = not applicable.

ARRA = American Recovery and Reinvestment Act of 2009; 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; S&E = science and engineering; USDA = U.S. Department of Agriculture.

^a NASA's R&D obligations decreased between FY 2006 and FY 2007 both because NASA excluded projects that were operational in nature in FY 2007 that were not excluded in FY 2006 and because of an overall decrease in obligations between FY 2006 and FY 2007.

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

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: \$1.6 billion in FY 2009. Together HHS and DOD provided Johns Hopkins with 83.3% of its federal S&E funds. The leading 20 universities, ranked in terms of federal academic S&E obligations, accounted for 34.4% of this FY 2009 federal total

(including ARRA). Nineteen of these institutions were also ranked among the top 20 recipients in FY 2008. The Massachusetts Institute of Technology's rank fell from 17 to 21 in FY 2009 and the University of Colorado all campuses' rank rose from 21 to 19 (table 3).

Federal S&E Support to Nonprofit Institutions

NSF 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 2009 federal agencies obligated \$8.3 billion to 1,459 nonprofit institutions, an increase of 28.6% over the \$6.5 billion reported in FY 2008 (current dollars). ARRA funds accounted for \$966.3 million, or 11.6%, of the FY 2009 total. The main source of the increase in funding (78.3%) was HHS. Massachusetts General Hospital received the most federal R&D and R&D plant funds (\$383 million) among

TABLE 3. Federal academic S&E obligations, including ARRA, to the 20 universities receiving the largest amounts, by agency: FY 2009 (Current dollars in millions)

Institution	All federal obligations	DOD	DOE	HHS	NASA	NSF	USDA	Other agencies ^a
All institutions	36,167.9	3,179.1	1,675.7	21,261.7	732.0	6,829.5	1,301.9	1,188.0
Top 20 institutions	12,433.3	1,107.3	401.2	8,741.5	321.4	1,497.1	143.6	221.1
Johns Hopkins U., The ^b	1,565.5	522.4	4.9	782.4	203.0	45.3	0.6	7.0
U. MI all campuses	777.5	36.4	38.1	561.6	9.7	116.0	0.8	14.7
U. WA	761.8	50.8	20.5	536.1	6.6	117.5	4.9	25.4
U. PA	669.9	35.7	10.7	570.9	1.8	48.4	0.1	2.3
Columbia U. in the City of New York	667.9	13.2	25.9	499.9	8.3	104.4	0.0	16.1
U. CA, San Diego	662.1	48.2	19.4	432.2	3.4	131.1	0.0	27.8
U. CA, Los Angeles	619.4	27.8	22.1	462.6	11.7	94.6	0.2	0.3
U. WI-Madison	597.6	11.5	60.2	354.2	7.9	122.5	30.6	10.6
U. CA, San Francisco	567.3	1.6	0.4	560.6	0.6	3.2	0.0	0.9
Harvard U.	554.0	21.6	5.7	454.1	5.8	60.6	0.0	6.2
U. Pittsburgh all campuses	546.9	15.1	3.5	498.0	0.2	27.5	0.0	2.6
Duke U.	540.6	38.7	9.7	443.1	0.9	44.9	0.0	3.2
U. NC Chapel Hill	508.8	7.9	23.2	429.0	0.5	33.7	0.0	14.5
U. MN all campuses	500.8	7.1	51.0	304.9	4.0	83.7	32.1	18.1
Washington U. St. Louis	497.6	3.1	7.4	459.6	5.1	22.4	0.0	0.0
Stanford U.	497.5	39.6	14.8	366.2	11.7	63.5	0.0	1.8
Cornell U. all campuses	492.5	15.1	28.5	223.4	4.0	177.5	37.6	6.5
Yale U.	483.0	9.8	11.3	417.8	0.5	42.1	1.0	0.3
U. CO all campuses	469.7	15.5	9.8	271.1	27.8	88.6	1.0	56.0
PA State U. all campuses	452.7	186.2	33.8	113.7	7.9	69.5	34.8	6.7
All other academic institutions	23,734.6	2,071.8	1,274.5	12,520.2	410.6	5,332.4	1,158.3	966.9

ARRA = American Recovery and Reinvestment Act of 2009; 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; S&E = science and engineering; USDA = U.S. Department of Agriculture.

^a Includes data for these agencies: Departments of Commerce, Education, Homeland Security, Housing and Urban Development, Interior, Labor, and Transportation; Agency for International Development; Environmental Protection Agency; Appalachian Regional Commission; Nuclear Regulatory Commission; Office of Justice Programs (part of Department of Justice); and 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 2009.

nonprofits in FY 2009, with HHS providing 94.4% of this funding (table 4).

In FY 2009 the 10 leading nonprofit institutions in terms of these federal funds received 30.3% of the total funding to all nonprofits. Six of these recipients were hospitals or medical research institutes. Nine of these leading 10 nonprofits in FY 2009 also ranked among the top 10 in the prior year. Beth Israel Deaconess Medical Center (ranked 8th in FY 2009 and 12th in FY 2008) moved into the top 10, and the Henry M. Jackson Foundation for the Advancement of Military Medicine (ranked 11th in FY 2009 and 7th in FY 2008) fell out of the top 10 (table 4).

Data Sources, Limitations, and Availability

Gross domestic product implicit price deflators were used to convert current to constant dollars in this report. The

data on federal S&E obligations to academic and nonprofit institutions presented here were obtained from 19 agencies that responded to the FY 2009 Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions. 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
- *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* is funds used for scientific projects and

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.

TABLE 4. Federal research and development and R&D plant obligations, including ARRA, to the 10 independent nonprofit institutions receiving the largest amounts, by agency: FY 2009
(Current dollars in thousands)

Institution	All federal obligations	DOD	DOE	HHS	NASA	NSF	Other agencies ^a
All nonprofit institutions	8,319,542	1,507,481	316,896	5,467,554	187,826	553,849	285,936
Top 10 nonprofit institutions	2,517,870	855,476	27,877	1,455,202	0	158,068	21,245
Massachusetts General Hospital	382,563	17,383	0	361,207	0	3,972	0
MITRE Corp.	344,765	343,612	4	0	0	50	1,099
Brigham and Women's Hospital	324,852	6,372	0	318,080	0	400	0
Battelle Memorial Institute	302,914	255,179	27,573	1,847	0	0	18,314
Fred Hutchinson Cancer Research Ctr.	263,980	0	0	263,792	0	188	0
IIT Research Institute	232,359	229,505	0	2,853	0	0	0
Mayo Foundation	212,380	1,362	0	210,984	0	34	0
Beth Israel Deaconess Medical Ctr.	152,205	923	0	149,541	0	1,741	0
Dana-Farber Cancer Institute	150,944	1,140	300	146,898	0	2,607	0
Associated Universities Inc.	150,908	0	0	0	0	149,076	1,832
All other nonprofit institutions	5,801,672	652,005	289,019	4,012,352	187,826	395,781	264,691

ARRA = American Recovery and Reinvestment Act of 2009; 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 these agencies: Departments of Commerce, Education, Homeland Security, Housing and Urban Development, Interior, Labor, and Transportation; Agency for International Development; Environmental Protection Agency; Appalachian Regional Commission; Nuclear Regulatory Commission; Office of Justice Programs (part of Department of Justice); and Social Security Administration.

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 2009.

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 at increasing

precollege and undergraduate students' scientific knowledge.

The full set of detailed statistical tables on the FY 2009 Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions will be available online at <http://www.nsf.gov/statistics/fedsupport/>. Individual tables may be available in

advance of the full report. For more information, please contact the author.

Note

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).

RETURN THIS COVER SHEET TO ROOM P35 IF YOU
DO NOT WISH TO RECEIVE THIS MATERIAL OR
IF CHANGE OF ADDRESS IS NEEDED INDICATE
CHANGE INCLUDING ZIP CODE ON THE LABEL (DO
NOT REMOVE LABEL).

National Science Foundation
ARLINGTON, VA 22230
OFFICIAL BUSINESS

NSF 12-320