



Federal Funding for Research Drops by 9% in FY 2011

by Michael Yamaner¹

Current-dollar federal obligations for research decreased 9.0%, from \$63.7 billion in FY 2010 to \$58.0 billion in FY 2011, according to data from the National Science Foundation (NSF).² This decline was the result of the last of the 2009 American Recovery and Reinvestment Act (ARRA) stimulus funds being obligated in FY 2010, which accounted for \$5.7 billion (8.9%) of research obligations in FY 2010. Research obligations are estimated to remain relatively flat at \$58.1 billion in FY 2012, and they are projected to increase by \$1.9 billion (3.3%) to \$60.0 billion in FY 2013.

In inflation-adjusted terms, federal obligations for research fell 10.7% in FY 2011, following a 0.9% decline in FY 2010. Estimated research obligations continued falling in FY 2012 by 1.8% before edging up by 1.6%, according to FY 2013 projections (table 1).

Figures for FY 2011 are actual amounts, those for FY 2012 are preliminary, and those for FY 2013 are projected. For the remainder of this report, discussions of changes in funding across years are in terms of inflation-adjusted (or constant) dollars unless stated otherwise.

Total Research and Development by Agency

Total federal constant-dollar R&D obligations decreased 5.3% to \$119.1 billion between FY 2010 and FY 2011. This decline is primarily due to the last of the ARRA funds (\$5.9 billion) having been obligated in FY 2010 (table 1). Even absent the ARRA obligations, R&D decreased by \$775 million (0.6%) in FY 2011. R&D obligations were estimated to decrease 2.3% to \$116.4 billion in FY 2012 and were projected to decrease 0.4% to \$115.9 billion in FY 2013.

In FY 2011, six federal departments and agencies accounted for 96.0% of FY 2011 total federal R&D dollars: the Department of Defense (DOD) (55.5% of total R&D obligations), the Department of Health and Human Services (HHS) (22.8%), the Department of Energy (DOE) (7.3%), the National Aeronautics and Space Administration (NASA) (4.8%), NSF (3.8%), and the U.S. Department of Agriculture (USDA) (1.7%) (table 2).

Federal Funding for Research by Agency

The six departments and agencies that accounted for most federal R&D

dollars in FY 2011 also accounted for most (92.3%) of FY 2011 total federal research dollars. However, their research shares differed considerably from their R&D shares, reflecting the emphasis their varying missions place on research versus development: HHS (53.0% of total research obligations), DOE (12.7%), DOD (11.4%), NSF (8.9%), USDA (3.7%), and NASA (2.7%) (table 3).

Basic Research

Basic research obligations decreased 9.6% to \$25.8 billion between FY 2010 and FY 2011. ARRA funds accounted for \$2.4 billion of FY 2010's \$28.5 billion basic research total. Even without the ARRA funds, basic research obligations decreased by 1.3% in FY 2011. Basic research obligations were estimated to decrease 1.4%, to \$25.4 billion in FY 2012 and were projected to increase by 0.5% in FY 2013 to \$25.5 billion. Basic research obligations accounted for 21.0% of total R&D and R&D plant in FY 2011 (table 1).

Applied Research

Federal obligations for applied research decreased 11.8% to \$25.2 billion between FY 2010 and FY 2011. Even

TABLE 1. Federal obligations for research and development and R&D plant, by character of work: FY 2009–13

Character of work	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
				preliminary	projected				preliminary	projected
Current \$millions						Constant 2005 \$millions				
All R&D and R&D plant ^a	144,758	146,968	139,662	139,159	141,176	131,003	131,786	122,812	120,151	119,905
ARRA	10,081	9,049	na	na	na	9,123	8,114	na	na	na
Non-ARRA	134,677	137,919	139,662	139,159	141,176	121,880	123,672	122,812	120,151	119,905
R&D	141,090	140,355	135,491	134,786	136,472	127,683	125,856	119,144	116,375	115,910
ARRA	8,714	6,621	na	na	na	7,886	5,937	na	na	na
Non-ARRA	132,376	133,734	135,491	134,786	136,472	119,797	119,919	119,144	116,375	115,910
Research	63,692	63,728	58,024	58,050	59,969	57,640	57,145	51,024	50,121	50,933
ARRA	7,727	5,702	na	na	na	6,993	5,113	na	na	na
Non-ARRA	55,965	58,026	58,024	58,050	59,969	50,647	52,032	51,024	50,121	50,933
Basic	32,879	31,795	29,314	29,426	30,066	29,755	28,511	25,777	25,407	25,536
ARRA	5,116	2,667	na	na	na	4,630	2,391	na	na	na
Non-ARRA	27,764	29,128	29,314	29,426	30,066	25,126	26,119	25,777	25,407	25,536
Applied	30,813	31,933	28,710	28,624	29,903	27,885	28,634	25,246	24,714	25,397
ARRA	2,611	3,035	na	na	na	2,363	2,721	na	na	na
Non-ARRA	28,202	28,897	28,710	28,624	29,903	25,522	25,912	25,246	24,714	25,397
Development	77,398	76,627	77,467	76,736	76,502	70,043	68,711	68,121	66,255	64,975
ARRA	987	918	na	na	na	893	823	na	na	na
Non-ARRA	76,411	75,708	77,467	76,736	76,502	69,150	67,887	68,121	66,255	64,975
R&D plant	3,668	6,613	4,171	4,373	4,705	3,319	5,930	3,668	3,776	3,996
ARRA	1,368	2,428	na	na	na	1,238	2,177	na	na	na
Non-ARRA	2,300	4,185	4,171	4,373	4,705	2,081	3,753	3,668	3,776	3,996

na = not applicable.

ARRA = American Recovery and Reinvestment Act of 2009.

^a Beginning in FY 2011, Department of Defense totals include additional classified R&D projects not previously reported by its subagencies.

NOTES: Gross domestic product implicit price deflators for 2005 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 Funds for Research and Development.

without the FY 2010 ARRA funds, applied research decreased by 2.6% in FY 2011. Applied research obligations were estimated to decrease 2.1% between FY 2011 and FY 2012 to \$24.7 billion and were projected to increase 2.8% in FY 2013 to \$25.4 billion. Applied research obligations accounted for 20.6% of total R&D and R&D plant in FY 2011 (table 1).

Research by Broad Field of Science and Engineering

Six of the broad fields of science and engineering experienced decreased federal research funding between FY 2010 and FY 2011. The two fields expe-

riencing the largest decreases were life sciences (down \$4.5 billion, or 14.9%) and engineering (down \$1.1 billion, or 11.0%). Two broad fields saw increased federal research funding between FY 2010 and FY 2011: social sciences (rose \$37 million, or 3.4%) and other sciences not elsewhere classified (rose \$0.5 billion, or 20.7%).³

In FY 2011, three broad fields of science and engineering received 77.4% of FY 2011 total federal research dollars: life sciences (50.7% of total research obligations), engineering (17.3%), and physical sciences (9.4%) (table 4).

Data Notes

The data presented here are from the NSF Survey of Federal Funds for Research and Development for FYs 2011–13. The 27 federal agencies that report R&D obligations to the survey submitted actual obligations for FY 2011, preliminary data for FY 2012, and projected data for FY 2013. Data were requested from agencies beginning in March 2012. Agencies later revise the preliminary data based on actual changes in the funding levels of R&D programs. Further, agencies may provide changes in prior-year data to reflect program reclassifications or other data corrections.

TABLE 2. Federal obligations for research and development, by agency in FY 2011 rank order: FY 2009–13

Agency	Current \$millions					Constant 2005 \$millions				
	2009	2010	2011	2012 preliminary	2013 projected	2009	2010	2011	2012 preliminary	2013 projected
All agencies ^a	141,090	140,355	135,491	134,786	136,472	127,683	125,856	119,144	116,375	115,910
ARRA	8,714	6,621	na	na	na	7,886	5,937	na	na	na
Non-ARRA	132,376	133,734	135,491	134,786	136,472	119,797	119,919	119,144	116,375	115,910
DOD ^a	75,857	73,471	75,157	74,504	73,725	68,649	65,881	66,090	64,327	62,617
ARRA	184	120	na	na	na	167	108	na	na	na
Non-ARRA	75,672	73,351	75,157	74,504	73,725	68,481	65,774	66,090	64,327	62,617
HHS	35,584	35,935	30,849	30,916	30,853	32,203	32,223	27,127	26,693	26,204
ARRA	4,889	4,696	na	na	na	4,424	4,211	na	na	na
Non-ARRA	30,695	31,238	30,849	30,916	30,853	27,778	28,011	27,127	26,693	26,204
DOE	9,890	10,686	9,946	9,592	10,683	8,950	9,582	8,746	8,282	9,073
ARRA	1,393	1,217	na	na	na	1,261	1,091	na	na	na
Non-ARRA	8,496	9,469	9,946	9,592	10,683	7,689	8,491	8,746	8,282	9,073
NASA	5,937	7,121	6,571	6,612	6,972	5,373	6,385	5,778	5,709	5,922
ARRA	315	385	na	na	na	285	345	na	na	na
Non-ARRA	5,622	6,736	6,571	6,612	6,972	5,088	6,040	5,778	5,709	5,922
NSF	6,095	5,016	5,146	5,177	5,423	5,516	4,498	4,525	4,470	4,606
ARRA	1,808	38	na	na	na	1,636	34	na	na	na
Non-ARRA	4,288	4,978	5,146	5,177	5,423	3,881	4,464	4,525	4,470	4,606
USDA	2,267	2,364	2,341	2,460	2,269	2,052	2,120	2,059	2,124	1,927
ARRA	0	0	na	na	na	0	0	na	na	na
Non-ARRA	2,267	2,364	2,341	2,460	2,269	2,052	2,120	2,059	2,124	1,927
Other	5,460	5,762	5,482	5,525	6,546	4,941	5,167	4,821	4,770	5,560
ARRA	125	164	na	na	na	113	147	na	na	na
Non-ARRA	5,335	5,598	5,482	5,525	6,546	4,828	5,020	4,821	4,770	5,560

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; USDA = U.S. Department of Agriculture.

^a Beginning in FY 2011, DOD totals include additional classified R&D projects not previously reported by its subagencies.

NOTES: Gross domestic product implicit price deflators for 2005 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 Funds for Research and Development.

In order to enable reporting from the Department of Defense’s subagencies engaged in classified R&D projects, starting with the FY 2011–13 survey cycle the DOD subagencies are reported as an aggregate total under Other defense agencies.

Definitions of *research, development, and R&D plant* as used in this InfoBrief are provided in the technical notes that accompany the detailed statistical tables report for this survey. For the prior-year report, see <http://nsf.gov/statistics/nsf13326/>.

The full set of detailed tables from this survey will be available in the report *Federal Funds for Research and Development: Fiscal Years 2011–13* at <http://www.nsf.gov/statistics/fedfunds/>. Individual detailed tables from the FY 2011–13 survey may be

TABLE 3. Federal obligations for research, by agency in FY 2011 rank order: FY 2009–13

Agency	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
	Current \$millions					Constant 2005 \$millions				
All agencies	63,692	63,728	58,024	58,050	59,969	57,640	57,145	51,024	50,121	50,933
ARRA	7,727	5,702	na	na	na	6,993	5,113	na	na	na
Non-ARRA	55,965	58,026	58,024	58,050	59,969	50,647	52,032	51,024	50,121	50,933
HHS	35,490	35,797	30,771	30,845	30,785	32,118	32,099	27,059	26,632	26,147
ARRA	4,888	4,694	na	na	na	4,424	4,209	na	na	na
Non-ARRA	30,601	31,104	30,771	30,845	30,785	27,693	27,891	27,059	26,632	26,147
DOE	7,188	7,598	7,350	7,086	7,989	6,505	6,813	6,463	6,118	6,785
ARRA	843	652	na	na	na	763	585	na	na	na
Non-ARRA	6,346	6,946	7,350	7,086	7,989	5,743	6,228	6,463	6,118	6,785
DOD	6,792	7,065	6,596	6,619	6,769	6,147	6,335	5,800	5,715	5,749
ARRA	38	45	na	na	na	34	40	na	na	na
Non-ARRA	6,753	7,021	6,596	6,619	6,769	6,111	6,296	5,800	5,715	5,749
NSF	6,095	5,016	5,146	5,177	5,423	5,516	4,498	4,525	4,470	4,606
ARRA	1,808	38	na	na	na	1,636	34	na	na	na
Non-ARRA	4,288	4,977	5,146	5,177	5,423	3,881	4,463	4,525	4,470	4,606
USDA	2,076	2,141	2,125	2,246	2,065	1,879	1,920	1,869	1,939	1,754
ARRA	0	0	na	na	na	0	0	na	na	na
Non-ARRA	2,076	2,141	2,125	2,246	2,065	1,879	1,920	1,869	1,939	1,754
NASA	1,703	1,503	1,575	1,637	1,867	1,541	1,348	1,385	1,413	1,586
ARRA	25	110	na	na	na	23	99	na	na	na
Non-ARRA	1,678	1,393	1,575	1,637	1,867	1,519	1,249	1,385	1,413	1,586
Other	4,348	4,607	4,462	4,440	5,071	3,935	4,131	3,924	3,834	4,307
ARRA	124	163	na	na	na	112	146	na	na	na
Non-ARRA	4,223	4,444	4,462	4,440	5,071	3,822	3,985	3,924	3,834	4,307

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; USDA = U.S. Department of Agriculture.

NOTES: Gross domestic product implicit price deflators for 2005 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 Funds for Research and Development.

TABLE 4. Federal obligations for research, by broad field of science and engineering: FY 2009–13

Character of work	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
	Current \$millions								Constant 2005 \$millions	
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
All fields	63,692	63,728	58,024	58,050	59,969	57,640	57,145	51,024	50,121	50,933
Computer sciences and mathematics	3,612	3,412	3,374	3,451	3,751	3,269	3,060	2,967	2,980	3,186
Engineering	10,285	11,081	10,057	9,873	10,743	9,308	9,936	8,844	8,524	9,124
Environmental sciences	3,751	3,339	3,207	3,079	3,140	3,395	2,994	2,820	2,658	2,667
Life sciences	33,267	33,909	29,409	29,061	29,152	30,106	30,406	25,861	25,092	24,760
Physical sciences	5,821	5,871	5,427	5,574	5,950	5,268	5,265	4,772	4,813	5,054
Psychology	2,086	2,156	1,887	1,914	1,923	1,888	1,933	1,659	1,653	1,633
Social sciences	1,157	1,197	1,262	1,203	1,253	1,047	1,073	1,110	1,039	1,064
Other sciences, nec	3,713	2,763	3,401	3,894	4,058	3,360	2,478	2,991	3,362	3,447

nec = not elsewhere classified.

NOTES: Gross domestic product implicit price deflators for 2005 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 Funds for Research and Development.

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

Notes

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2. *Obligations* represent the amounts for orders placed, contracts awarded, services received, and similar transactions during a given period, regardless

of when the funds were appropriated and when future payment of money is required.

3. “*Other sciences not elsewhere classified*” is used for multidisciplinary or interdisciplinary projects that cannot be classified within one of the broad fields of science.

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