



National Center for Science and
Engineering Statistics

FFRDC Research and Development Expenditures: Fiscal Year 2021

Data Tables | NSF 22-332 | July 28, 2022

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General Notes

This report provides data from the 2021 Federally Funded Research and Development Center (FFRDC) Research and Development Survey. This survey is the primary source of information on separately accounted R&D expenditures at FFRDCs in the United States. Conducted annually for university-administered FFRDCs since FY 1953 and all FFRDCs since FY 2001, the survey collects information on R&D expenditures by source of funds and types of research and expenses. The survey is an annual census of the full population of eligible FFRDCs. See <https://www.nsf.gov/statistics/ffrdclist/> for the Master Government List of FFRDCs maintained by the National Science Foundation.

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TABLE 1

R&D expenditures at federally funded research and development centers, by source of funds: FYs 2001–21

(Dollars in thousands)

Fiscal year	All R&D expenditures	Federal government	State and local government	Business	Nonprofit organizations	All other sources ^a
2001	10,071,307	9,709,221	19,389	144,043	na	198,654
2002	11,536,424	11,095,110	31,423	134,251	na	275,640
2003	12,126,880	11,681,318	33,301	138,685	na	273,576
2004	12,632,207	12,321,652	29,959	119,843	na	160,753
2005	13,254,522	12,917,206	32,339	129,036	na	175,941
2006	13,218,497	12,824,552	30,122	170,879	na	192,944
2007	13,824,987	13,401,081	32,072	172,592	na	219,242
2008	15,616,390	15,177,347	32,188	202,534	na	204,321
2009	16,390,111	15,942,851	35,442	189,721	na	222,097
2010	18,880,609	18,453,552	52,871	168,561	23,665	181,960
2011	18,671,245	18,276,088	26,744	190,111	38,878	139,424
2012	18,280,943	17,875,012	39,428	184,434	45,926	136,143
2013	17,667,184	17,284,513	50,449	186,911	39,390	105,921
2014	17,718,556	17,331,396	28,337	220,735	37,182	100,906
2015	18,458,257	18,097,189	18,427	208,780	27,984	105,877
2016	19,219,702	18,855,593	21,556	192,239	40,195	110,119
2017	20,038,307	19,667,804	29,029	192,107	46,526	102,841
2018	21,171,529	20,770,388	43,458	197,975	43,630	116,078
2019	22,737,500	22,338,855	51,167	180,583	48,238	118,657
2020	23,514,241	23,133,501	43,995	172,866	47,056	116,823
2021	24,921,476	24,509,691	43,774	195,954	49,016	123,041

na = not applicable; data from nonprofit organizations were not collected separately.

^a Prior to FY 2010, R&D expenditures from nonprofit organizations were collected under All other sources.**Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

TABLE 2

Total and federally financed R&D expenditures at federally funded research and development centers, by type of R&D: FYs 2001–21

(Dollars in millions)

Fiscal year	Total								Federally financed							
	All R&D expenditures	Basic research		Applied research		Experimental development		All R&D expenditures	Basic research		Applied research		Experimental development			
		Amount	Percent	Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent	Amount	Percent		
2001	10,071	3,875	38.5	na	na	na	na	9,709	3,726	38.4	na	na	na	na		
2002	11,536	4,744	41.1	na	na	na	na	11,095	4,523	40.8	na	na	na	na		
2003	12,127	5,122	42.2	na	na	na	na	11,681	4,880	41.8	na	na	na	na		
2004	12,632	4,931	39.0	na	na	na	na	12,322	4,790	38.9	na	na	na	na		
2005	13,255	5,110	38.5	na	na	na	na	12,917	4,977	38.5	na	na	na	na		
2006	13,218	5,197	39.3	na	na	na	na	12,825	5,048	39.4	na	na	na	na		
2007 ^a	13,825	5,296	38.3	3,479	25.2	4,411	31.9	13,401	5,151	38.4	3,314	24.7	4,319	32.2		
2008	15,616	5,379	34.4	3,992	25.6	6,245	40.0	15,177	5,210	34.3	3,825	25.2	6,143	40.5		
2009	16,390	5,871	35.8	4,545	27.7	5,974	36.4	15,943	5,714	35.8	4,346	27.3	5,884	36.9		
2010	18,881	6,655	35.2	5,191	27.5	7,034	37.3	18,454	6,487	35.2	5,031	27.3	6,935	37.6		
2011	18,671	6,582	35.3	5,175	27.7	6,914	37.0	18,276	6,439	35.2	5,006	27.4	6,830	37.4		
2012	18,281	6,153	33.7	5,382	29.4	6,746	36.9	17,875	6,013	33.6	5,209	29.1	6,653	37.2		
2013	17,667	4,186	23.7	6,818	38.6	6,663	37.7	17,285	4,081	23.6	6,636	38.4	6,568	38.0		
2014	17,719	4,195	23.7	6,839	38.6	6,684	37.7	17,331	4,098	23.6	6,648	38.4	6,585	38.0		
2015	18,458	4,094	22.2	7,292	39.5	7,072	38.3	18,097	4,012	22.2	7,118	39.3	6,968	38.5		
2016	19,220	4,224	22.0	7,527	39.2	7,468	38.9	18,856	4,136	21.9	7,373	39.1	7,347	39.0		
2017	20,038	4,111	20.5	7,931	39.6	7,996	39.9	19,668	4,039	20.5	7,756	39.4	7,873	40.0		
2018	21,172	4,180	19.7	8,391	39.6	8,600	40.6	20,770	4,099	19.7	8,205	39.5	8,466	40.8		
2019	22,738	4,536	19.9	9,200	40.5	9,002	39.6	22,339	4,455	19.9	9,014	40.4	8,869	39.7		
2020	23,514	4,712	20.0	9,433	40.1	9,369	39.8	23,134	4,637	20.0	9,257	40.0	9,239	39.9		
2021	24,921	5,021	20.1	9,951	39.9	9,949	39.9	24,510	4,945	20.2	9,765	39.8	9,799	40.0		

na = not applicable; separate data for applied research and experimental development were not collected before FY 2007.

^a FY 2007 detail does not add to total because one institution was unable to provide a breakout of applied research and experimental development expenditures.**Note(s):**

Because of rounding, detail may not add to total.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

TABLE 3

Federally financed R&D expenditures from federal agencies: FY 2021

(Dollars in thousands)

Federal agency	R&D expenditures
All federal agencies	24,509,691
Administrative Office of the U.S. Courts	5,493
Agency for International Development	7,961
Architect of the Capitol	336
Central Intelligence Agency	1,835
Consumer Product Safety Commission	185
Department of Agriculture	4,398
Department of Commerce	77,614
Department of Defense	5,459,887
Department of Energy	12,983,595
Department of Health and Human Services	1,300,799
Department of Homeland Security	538,975
Department of Justice	22,300
Department of State	41,317
Department of the Interior	12,867
Department of the Treasury	173,709
Department of Transportation	250,334
Department of Veterans Affairs	112,703
Environmental Protection Agency	6,439
Executive Office of the President	896
General Services Administration	1,017
National Aeronautics and Space Administration	2,629,810
National Credit Union Administration	244
National Science Foundation	315,920
Nuclear Regulatory Commission	41,674
Office of the Director of National Intelligence	16,007
U.S. Postal Service	231
Other agencies not listed ^a	503,145

^a Some funding sources were not identified for security reasons or because the original source was not known.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2021.

TABLE 4

R&D expenditures at federally funded research and development centers, by source of funds and FFRDC: FY 2021

(Dollars in thousands)

FFRDC	All R&D expenditures	Federal government	State and local government	Business	Nonprofit organizations	All other sources
All FFRDCs	24,921,476	24,509,691	43,774	195,954	49,016	123,041
University-administered FFRDCs	6,850,276	6,700,555	16,003	61,027	20,075	52,616
Ames Laboratory	34,214	34,016	15	183	0	0
Argonne National Laboratory	856,568	832,400	109	19,241	246	4,572
Fermi National Accelerator Laboratory	319,051	317,812	0	472	547	220
Green Bank Observatory	8,629	8,629	0	0	0	0
Jet Propulsion Laboratory	2,388,355	2,388,355	0	0	0	0
Lawrence Berkeley National Laboratory	966,972	910,428	10,372	25,431	5,093	15,648
Lincoln Laboratory	1,136,133	1,110,465	0	3,170	0	22,498
National Center for Atmospheric Research	181,010	161,163	1,178	7,340	11,329	0
National Radio Astronomy Observatory	94,202	93,313	0	260	374	255
National Solar Observatory	17,684	17,680	0	0	0	4
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	75,251	73,393	0	0	0	1,858
Princeton Plasma Physics Laboratory	115,505	113,591	0	341	0	1,573
SLAC National Accelerator Laboratory	396,780	382,252	2,183	4,011	2,440	5,894
Software Engineering Institute	120,443	120,443	0	0	0	0
Thomas Jefferson National Accelerator Facility	139,479	136,615	2,146	578	46	94
Nonprofit-administered FFRDCs	8,370,508	8,215,876	25,413	71,285	28,131	29,803
Aerospace Federally Funded Research and Development Center	1,128,241	1,121,569	0	5,294	0	1,378
Arroyo Center	38,304	38,304	0	0	0	0
Brookhaven National Laboratory	637,658	620,000	7,673	6,663	539	2,783
Center for Advanced Aviation System Development	230,484	207,828	0	4,416	2,968	15,272
Center for Communications and Computing	65,255	65,255	0	0	0	0
Center for Enterprise Modernization	263,661	263,661	0	0	0	0
Center for Naval Analyses	96,391	96,391	0	0	0	0
Center for Nuclear Waste Regulatory Analyses	5,630	5,233	50	222	8	117
CMS Alliance to Modernize Healthcare	348,269	348,269	0	0	0	0
Homeland Security Operational Analysis Center	34,888	34,888	0	0	0	0
Homeland Security Systems Engineering and Development Institute	183,588	182,413	155	9	794	217
Judiciary Engineering and Modernization Center	5,493	5,493	0	0	0	0
National Biodefense Analysis and Countermeasures Center	44,968	44,968	0	0	0	0
National Cybersecurity Center of Excellence	33,671	33,671	0	0	0	0
National Defense Research Institute	66,170	66,170	0	0	0	0
National Renewable Energy Laboratory	559,151	497,047	7,172	40,437	14,495	0
National Security Engineering Center	1,468,298	1,463,965	0	0	1,398	2,935
Oak Ridge National Laboratory	1,760,578	1,746,756	512	7,894	1,310	4,106
Pacific Northwest National Laboratory	1,168,268	1,142,925	9,851	6,350	6,619	2,523
Project Air Force	47,966	47,966	0	0	0	0
Science and Technology Policy Institute	9,784	9,784	0	0	0	0
Systems and Analyses Center	173,792	173,320	0	0	0	472
Industry-administered FFRDCs	9,700,692	9,593,260	2,358	63,642	810	40,622
Frederick National Laboratory for Cancer Research	861,605	861,605	0	0	0	0
Idaho National Laboratory	516,691	503,977	490	6,139	139	5,946
Lawrence Livermore National Laboratory	1,613,673	1,580,263	1,245	12,400	671	19,094
Los Alamos National Laboratory	2,974,164	2,950,380	0	23,784	0	0

TABLE 4

R&D expenditures at federally funded research and development centers, by source of funds and FFRDC: FY 2021

(Dollars in thousands)

FFRDC	All R&D expenditures	Federal government	State and local government	Business	Nonprofit organizations	All other sources
Sandia National Laboratories	3,542,756	3,507,607	623	18,944	NA	15,582
Savannah River National Laboratory	191,803	189,428	0	2,375	0	0

NA = not available; data were not provided by institution.

FFRDC = federally funded research and development center; NSF = National Science Foundation.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2021.

TABLE 5

Federally financed R&D expenditures at federally funded research and development centers, by federal agency and FFRDC: FY 2021

(Dollars in thousands)

FFRDC	All federal R&D expenditures	DOD	DOE	HHS	DHS	DOT	NASA	NSF	Other
All FFRDCs	24,509,691	5,459,887	12,983,595	1,300,799	538,975	250,334	2,629,810	315,920	1,030,371
University-administered FFRDCs	6,700,555	1,132,607	2,587,693	38,095	84,437	34,884	2,448,098	307,909	66,832
Ames Laboratory	34,016	0	33,919	0	0	0	0	0	97
Argonne National Laboratory	832,400	28,310	746,382	5,550	25,883	5,181	400	2,420	18,274
Fermi National Accelerator Laboratory	317,812	57	317,755	0	0	0	0	0	0
Green Bank Observatory	8,629	0	0	0	0	0	0	8,629	0
Jet Propulsion Laboratory	2,388,355	0	0	0	0	0	2,388,355	0	0
Lawrence Berkeley National Laboratory	910,428	14,845	860,091	24,463	738	573	4,166	0	5,552
Lincoln Laboratory	1,110,465	999,818	3,121	0	23,677	23,548	38,680	0	21,621
National Center for Atmospheric Research	161,163	5,841	3,665	232	0	5,357	12,627	120,193	13,248
National Radio Astronomy Observatory	93,313	540	0	0	0	0	347	92,425	1
National Solar Observatory	17,680	35	0	0	0	0	1,032	16,613	0
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	73,393	16	5,304	0	0	0	779	67,294	0
Princeton Plasma Physics Laboratory	113,591	77	112,975	0	0	0	440	99	0
SLAC National Accelerator Laboratory	382,252	3,049	366,771	6,741	1,609	0	785	236	3,061
Software Engineering Institute	120,443	80,019	1,095	1,109	32,530	225	487	0	4,978
Thomas Jefferson National Accelerator Facility	136,615	0	136,615	0	0	0	0	0	0
Nonprofit-administered FFRDCs	8,215,876	2,948,125	3,428,488	383,901	358,749	213,850	122,770	7,971	752,022
Aerospace Federally Funded Research and Development Center	1,121,569	983,248	14,972	0	1,922	1,018	80,019	153	40,237
Arroyo Center	38,304	38,304	0	0	0	0	0	0	0
Brookhaven National Laboratory	620,000	1,259	590,230	3,431	1,189	0	8,600	77	15,214
Center for Advanced Aviation System Development	207,828	0	0	0	0	207,518	125	0	185
Center for Communications and Computing	65,255	65,255	0	0	0	0	0	0	0
Center for Enterprise Modernization	263,661	0	150	0	0	0	651	0	262,860
Center for Naval Analyses	96,391	96,391	0	0	0	0	0	0	0
Center for Nuclear Waste Regulatory Analyses	5,233	54	391	0	0	80	38	0	4,670
CMS Alliance to Modernize Healthcare	348,269	0	0	348,269	0	0	0	0	0
Homeland Security Operational Analysis Center	34,888	0	0	0	34,888	0	0	0	0
Homeland Security Systems Engineering and Development Institute	182,413	0	0	0	182,413	0	0	0	0
Judiciary Engineering and Modernization Center	5,493	0	0	0	0	0	0	0	5,493
National Biodefense Analysis and Countermeasures Center	44,968	487	0	1,146	30,305	0	0	0	13,030

TABLE 5

Federally financed R&D expenditures at federally funded research and development centers, by federal agency and FFRDC: FY 2021

(Dollars in thousands)

FFRDC	All federal R&D expenditures	DOD	DOE	HHS	DHS	DOT	NASA	NSF	Other
National Cybersecurity Center of Excellence	33,671	0	0	0	0	0	0	0	33,671
National Defense Research Institute	66,170	64,452	0	0	0	0	0	0	1,718
National Renewable Energy Laboratory	497,047	17,333	463,952	0	2,147	917	285	0	12,413
National Security Engineering Center	1,463,965	1,238,466	0	0	0	0	42	0	225,457
Oak Ridge National Laboratory	1,746,756	68,364	1,509,726	7,092	11,087	4,317	31,100	0	115,070
Pacific Northwest National Laboratory	1,142,925	170,244	848,956	22,567	83,872	0	1,612	815	14,859
Project Air Force	47,966	47,966	0	0	0	0	0	0	0
Science and Technology Policy Institute	9,784	780	33	1,396	23	0	223	6,926	403
Systems and Analyses Center	173,320	155,522	78	0	10,903	0	75	0	6,742
Industry-administered FFRDCs	9,593,260	1,379,155	6,967,414	878,803	95,789	1,600	58,942	40	211,517
Frederick National Laboratory for Cancer Research	861,605	164	0	861,420	0	0	0	0	21
Idaho National Laboratory	503,977	79,649	391,056	0	13,210	416	3,293	0	16,353
Lawrence Livermore National Laboratory	1,580,263	279,178	1,262,813	7,445	21,909	0	1,989	0	6,929
Los Alamos National Laboratory	2,950,380	80,032	2,724,200	8,249	5,294	0	52,996	40	79,569
Sandia National Laboratories	3,507,607	917,136	2,424,747	1,689	53,568	1,184	664	0	108,619
Savannah River National Laboratory	189,428	22,996	164,598	0	1,808	0	0	0	26

DHS = Department of Homeland Security; DOD = Department of Defense; DOE = Department of Energy; DOT = Department of Transportation; FFRDC = federally funded research and development center; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2021.

TABLE 6

Total and federally financed R&D expenditures at federally funded research and development centers, by type of R&D and FFRDC: FY 2021

(Dollars in thousands)

FFRDC	Sponsor	Location	Total				Federally financed			
			All R&D expenditures	Basic research	Applied research	Experimental development	All R&D expenditures	Basic research	Applied research	Experimental development
All FFRDCs	-	-	24,921,476	5,021,363	9,951,077	9,949,036	24,509,691	4,944,919	9,765,401	9,799,371
University-administered FFRDCs	-	-	6,850,276	2,427,236	1,865,292	2,557,748	6,700,555	2,366,204	1,813,850	2,520,501
Ames Laboratory	DOE	Ames, IA	34,214	17,080	16,672	462	34,016	17,080	16,641	295
Argonne National Laboratory	DOE	Argonne, IL	856,568	171,352	405,211	280,005	832,400	171,352	382,966	278,082
Fermi National Accelerator Laboratory	DOE	Batavia, IL	319,051	317,533	1,518	0	317,812	316,686	1,126	0
Green Bank Observatory	NSF	Green Bank, WV	8,629	8,629	0	0	8,629	8,629	0	0
Jet Propulsion Laboratory	NASA	Pasadena, CA	2,388,355	238,836	238,836	1,910,683	2,388,355	238,836	238,836	1,910,683
Lawrence Berkeley National Laboratory	DOE	Berkeley, CA	966,972	799,146	141,453	26,373	910,428	757,636	129,078	23,714
Lincoln Laboratory	DOD, OSD	Lexington, MA	1,136,133	13,469	996,957	125,707	1,110,465	13,469	996,957	100,039
National Center for Atmospheric Research	NSF	Boulder, CO	181,010	49,570	31,398	100,042	161,163	45,166	22,168	93,829
National Radio Astronomy Observatory	NSF	Charlottesville, VA	94,202	82,014	574	11,614	93,313	81,940	376	10,997
National Solar Observatory	NSF	Boulder, CO	17,684	17,684	0	0	17,680	17,680	0	0
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	NSF	Tucson, AZ	75,251	75,251	0	0	73,393	73,393	0	0
Princeton Plasma Physics Laboratory	DOE	Princeton, NJ	115,505	115,068	437	0	113,591	113,337	254	0
SLAC National Accelerator Laboratory	DOE	Menlo Park, CA	396,780	374,582	22,198	0	382,252	366,842	15,410	0
Software Engineering Institute	DOD, OSD	Pittsburgh, PA	120,443	7,543	10,038	102,862	120,443	7,543	10,038	102,862
Thomas Jefferson National Accelerator Facility	DOE	Newport News, VA	139,479	139,479	0	0	136,615	136,615	0	0
Nonprofit-administered FFRDCs	-	-	8,370,508	1,728,236	2,302,607	4,339,665	8,215,876	1,722,688	2,233,492	4,259,696
Aerospace Federally Funded Research and Development Center	DOD, Air Force	El Segundo, CA	1,128,241	24,986	108,438	994,817	1,121,569	24,652	102,100	994,817
Arroyo Center	DOD, Army	Santa Monica, CA	38,304	0	38,304	0	38,304	0	38,304	0
Brookhaven National Laboratory	DOE	Upton, NY	637,658	476,421	91,598	69,639	620,000	475,993	88,512	55,495
Center for Advanced Aviation System Development	DOT, FAA	McLean, VA	230,484	0	10,632	219,852	207,828	0	9,587	198,241
Center for Communications and Computing	DOD, NSA/ CSS	Alexandria, VA	65,255	16,314	32,627	16,314	65,255	16,314	32,627	16,314
Center for Enterprise Modernization	Treasury/IRS, VA, SSA	McLean, VA	263,661	0	13,477	250,184	263,661	0	13,477	250,184
Center for Naval Analyses	DOD, Navy	Arlington, VA	96,391	0	96,391	0	96,391	0	96,391	0
Center for Nuclear Waste Regulatory Analyses	NRC	San Antonio, TX	5,630	0	5,630	0	5,233	0	5,233	0
CMS Alliance to Modernize Healthcare	HHS, CMS	Baltimore, MD	348,269	0	7,952	340,317	348,269	0	7,952	340,317
Homeland Security Operational Analysis Center	DHS, S&T	Pentagon City, VA	34,888	0	34,888	0	34,888	0	34,888	0

TABLE 6

Total and federally financed R&D expenditures at federally funded research and development centers, by type of R&D and FFRDC: FY 2021

(Dollars in thousands)

FFRDC	Sponsor	Location	Total				Federally financed			
			All R&D expenditures	Basic research	Applied research	Experimental development	All R&D expenditures	Basic research	Applied research	Experimental development
Homeland Security Systems Engineering and Development Institute	DHS, S&T	McLean, VA	183,588	0	4,759	178,829	182,413	0	4,729	177,684
Judiciary Engineering and Modernization Center	U.S. Courts	McLean, VA	5,493	0	274	5,219	5,493	0	274	5,219
National Biodefense Analysis and Countermeasures Center	DHS, S&T	Frederick, MD	44,968	0	44,968	0	44,968	0	44,968	0
National Cybersecurity Center of Excellence	NIST	Rockville, MD	33,671	0	857	32,814	33,671	0	857	32,814
National Defense Research Institute	DOD, OSD	Santa Monica, CA	66,170	0	66,170	0	66,170	0	66,170	0
National Renewable Energy Laboratory	DOE	Golden, CO	559,151	49,705	310,638	198,808	497,047	49,705	273,376	173,966
National Security Engineering Center	DOD,OSD	Bedford, MA/ McLean, VA	1,468,298	0	87,886	1,380,412	1,463,965	0	87,627	1,376,338
Oak Ridge National Laboratory	DOE	Oak Ridge, TN	1,760,578	940,199	820,379	0	1,746,756	940,199	806,557	0
Pacific Northwest National Laboratory	DOE	Richland, WA	1,168,268	220,611	295,197	652,460	1,142,925	215,825	288,793	638,307
Project Air Force	DOD, Air Force	Santa Monica, CA	47,966	0	47,966	0	47,966	0	47,966	0
Science and Technology Policy Institute	NSF	Washington, DC	9,784	0	9,784	0	9,784	0	9,784	0
Systems and Analyses Center	DOD, OSD	Alexandria, VA	173,792	0	173,792	0	173,320	0	173,320	0
Industry-administered FFRDCs	-	-	9,700,692	865,891	5,783,178	3,051,623	9,593,260	856,027	5,718,059	3,019,174
Frederick National Laboratory for Cancer Research	HHS, NIH	Frederick, MD	861,605	164,556	697,049	0	861,605	164,556	697,049	0
Idaho National Laboratory	DOE	Idaho Falls, ID	516,691	31,002	273,846	211,843	503,977	30,239	267,108	206,630
Lawrence Livermore National Laboratory	DOE	Livermore, CA	1,613,673	138,694	1,155,340	319,639	1,580,263	131,615	1,129,009	319,639
Los Alamos National Laboratory	DOE	Los Alamos, NM	2,974,164	237,933	2,706,490	29,741	2,950,380	236,030	2,684,846	29,504
Sandia National Laboratories	DOE	Albuquerque, NM	3,542,756	284,116	854,551	2,404,089	3,507,607	284,116	845,333	2,378,158
Savannah River National Laboratory	DOE	Aiken, SC	191,803	9,590	95,902	86,311	189,428	9,471	94,714	85,243

CMS = Centers for Medicare and Medicaid Services; DHS = Department of Homeland Security; DOD = Department of Defense; DOE = Department of Energy; DOT = Department of Transportation; FAA = Federal Aviation Administration; FFRDC = federally funded research and development center; HHS = Department of Health and Human Services; IRS = Internal Revenue Service; NASA = National Aeronautics and Space Administration; NIH = National Institutes of Health; NIST = National Institute of Science and Technology; NRC = Nuclear Regulatory Commission; NSA/CSS = National Security Agency/Central Security Service; NSF = National Science Foundation; OSD = Office of the Secretary of Defense; S&T = Science and Technology Directorate; SSA = Social Security Administration; VA = Department of Veterans Affairs.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2021.

TABLE 7

Total R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2001–21

(Dollars in thousands)

FFRDC	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 ^a	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
All FFRDCs	10,071,307	11,536,424	12,126,880	12,632,207	13,254,522	13,218,497	13,824,987	15,616,390	16,390,111	18,880,609	18,671,245	18,280,943	17,667,184	17,718,556	18,458,257	19,219,702	20,038,307	21,171,529	22,737,500	23,514,241	24,921,476
Aerospace Federally Funded Research and Development Center ^b	17,600	26,306	32,745	32,529	32,500	34,200	36,490	38,940	41,470	880,653	908,458	874,653	835,068	838,708	888,119	909,868	942,704	1,020,827	1,065,989	1,114,741	1,128,241
Ames Laboratory	22,916	23,416	25,213	27,227	29,293	26,460	25,254	27,306	29,012	30,836	32,442	33,853	34,234	41,824	45,845	46,886	53,527	36,858	33,612	32,844	34,214
Argonne National Laboratory	478,391	506,666	500,828	520,881	482,051	472,961	489,684	533,530	543,169	650,504	710,435	679,387	708,501	719,459	719,521	733,377	723,824	777,246	810,693	859,658	856,568
Arroyo Center	24,317	24,484	27,889	26,101	28,152	24,518	25,195	23,852	27,692	28,647	32,180	31,278	32,789	33,391	40,594	44,616	42,723	39,738	37,956	35,248	38,304
Brookhaven National Laboratory	454,500	454,482	452,728	450,342	483,039	490,686	510,212	480,455	569,240	535,546	526,571	516,921	529,634	573,364	587,194	579,087	556,875	552,640	590,470	595,466	637,658
Center for Advanced Aviation System Development	5,683	6,256	6,633	6,462	6,429	6,601	7,290	126,171	133,869	149,686	165,645	159,311	146,860	149,054	155,696	156,644	168,169	177,530	174,123	180,634	230,484
Center for Communications and Computing	43,100	45,296	45,960	50,238	50,800	51,500	57,400	59,500	66,293	71,927	72,600	62,600	51,477	63,199	56,478	61,625	66,692	68,237	68,371	67,072	65,255
Center for Enterprise Modernization	1,161	2,434	2,834	3,687	4,802	6,342	7,101	166,894	181,958	170,460	187,785	226,539	202,319	158,069	145,442	146,436	154,933	162,690	174,712	190,408	263,661
Center for Naval Analyses	69,102	72,712	75,869	79,087	83,837	87,499	99,993	106,967	109,694	109,068	85,165	91,628	86,132	80,283	80,358	84,232	90,401	95,198	96,697	95,874	96,391
Center for Nuclear Waste Regulatory Analyses	14,977	16,398	17,625	16,847	16,391	16,397	17,007	17,960	16,614	15,346	16,377	13,147	12,331	12,314	12,636	8,600	6,312	5,054	6,987	6,762	5,630
CMS Alliance to Modernize Healthcare	na	na	na	na	na	na	na	na	na	na	na	na	17,521	70,458	168,142	141,860	169,013	175,030	213,369	228,162	348,269
Fermi National Accelerator Laboratory	310,928	313,556	303,340	318,435	323,153	330,980	337,306	340,486	376,791	402,658	420,119	412,438	376,472	334,522	319,700	323,507	320,516	328,419	334,258	300,002	319,051
Frederick National Laboratory for Cancer Research	187,222	260,000	296,000	335,000	334,400	334,500	339,800	509,700	378,200	643,935	431,600	430,100	433,900	448,500	495,300	642,165	704,223	748,500	751,452	745,726	861,605

TABLE 7

Total R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2001–21

(Dollars in thousands)

FFRDC	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 ^a	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Green Bank Observatory ^c	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	NA	NA	NA	NA	8,629
Homeland Security Institute	na	na	na	na	NA	20,521	25,370	27,400	na	na	na	na	na	na	na	na	na	na	na	na	na
Homeland Security Operational Analysis Center	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	8,622	46,321	54,751	44,736	34,888
Homeland Security Studies and Analysis Institute	na	na	na	na	na	na	na	na	32,173	33,402	36,870	30,213	22,452	20,866	16,965	22,038	na	na	na	na	na
Homeland Security Systems Engineering and Development Institute	na	na	na	na	na	na	na	na	3,387	58,715	85,154	77,159	75,530	94,353	77,176	101,628	104,414	104,689	115,813	136,874	183,588
Idaho National Laboratory	270,636	259,562	330,154	180,306	232,289	163,074	248,322	236,037	388,062	478,356	425,072	536,399	496,818	479,801	476,376	521,618	482,840	395,112	478,324	494,094	516,691
Jet Propulsion Laboratory	1,355,463	1,435,039	1,390,560	1,551,171	1,606,409	1,548,019	1,717,203	1,733,597	1,711,528	1,640,341	1,543,969	1,493,613	1,519,258	1,664,539	1,749,689	1,852,369	2,324,826	2,733,908	2,709,063	2,638,412	2,388,355
Judiciary Engineering and Modernization Center	na	na	na	na	na	na	na	na	na	na	4,650	5,309	6,399	2,299	4,318	9,289	8,030	6,697	7,331	6,765	5,493
Lawrence Berkeley National Laboratory	408,487	467,461	441,500	482,159	482,672	485,626	503,775	573,917	611,711	759,381	788,386	767,554	768,563	762,601	792,457	797,831	813,267	832,457	872,237	916,082	966,972
Lawrence Livermore National Laboratory	1,090,875	1,227,111	1,286,215	1,425,840	1,456,368	1,431,019	1,353,980	1,301,874	1,321,633	1,370,747	1,424,993	1,353,454	1,313,293	1,170,571	1,273,066	1,363,525	1,290,134	1,386,687	1,517,429	1,558,071	1,613,673
Lincoln Laboratory	380,200	451,200	522,851	594,822	627,201	622,993	618,011	641,386	706,555	789,502	822,358	873,104	872,298	830,076	914,071	949,138	969,090	1,013,320	1,103,870	1,115,927	1,136,133
Los Alamos National Laboratory	1,333,194 ^e	1,994,031	2,106,145	1,986,235	2,101,211	2,145,200	2,046,260	2,073,538	2,172,179	2,505,913	2,307,197	2,056,878	1,708,000	1,767,000	1,865,000	1,987,000	1,972,769	2,145,232	2,461,275	2,722,375	2,974,164

TABLE 7

Total R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2001–21

(Dollars in thousands)

FFRDC	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 ^a	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
National Astronomy and Ionosphere Center	10,986	12,295	11,508	12,285	13,831	14,108	13,591	12,586	14,738	13,203	14,317	na	na	na	na	na	na	na	na	na	na
National Biodefense Analysis and Countermeasures Center	na	na	na	na	na	na	6,320	12,979	19,934	50,058	41,786	31,201	29,849	30,310	30,716	32,902	34,991	37,598	39,003	42,330	44,968
National Center for Atmospheric Research	119,846	157,173	140,756	154,714	135,893	153,343	144,293	161,130	203,627	220,328	198,231	169,743	172,527	162,259	166,385	177,422	171,551	158,260	199,476	188,484	181,010
National Cybersecurity Center of Excellence	na	na	na	na	na	na	na	na	na	na	na	na	na	na	7,843	13,076	13,436	19,556	22,205	23,557	33,671
National Defense Research Institute	25,512	25,317	26,908	26,550	25,747	34,203	38,152	40,051	42,265	51,652	46,330	53,832	59,460	62,073	56,736	62,848	69,013	57,743	67,647	64,134	66,170
National Radio Astronomy Observatory	34,208	43,900	42,842	42,215	52,023	40,771	129,000	146,098	151,396	137,607	81,305	79,168	93,253	85,327	89,689	90,411	91,720	100,691	101,901	100,078	94,202
National Renewable Energy Laboratory	207,230	197,438	221,496	226,460	211,323	196,449	190,874	229,399	273,640	326,652	386,539	398,873	347,368	359,998	378,436	362,087	357,916	388,500	455,016	511,585	559,151
National Security Engineering Center	29,458	31,163	32,696	35,932	37,213	37,073	46,368	936,228	939,312	925,027	941,187	946,737	928,614	885,382	919,441	966,542	1,012,155	1,078,610	1,124,861	1,143,701	1,468,298
National Solar Observatory	na	na	na	na	na	na	na	na	na	11,549	11,724	10,236	10,648	10,039	11,752	12,783	11,841	14,733	15,931	16,892	17,684
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	37,364	41,051	44,409	43,020	52,775	54,616	53,608	55,922	56,972	45,596	36,165	36,321	30,021	25,161	23,660	24,917	25,906	33,874	38,262	72,686	75,251
Oak Ridge National Laboratory	581,135	620,328	690,538	776,203	897,252	928,090	1,083,509	1,251,336	1,259,259	1,538,412	1,558,073	1,553,460	1,451,684	1,293,722	1,333,332	1,283,729	1,403,204	1,399,445	1,470,372	1,632,684	1,760,578

TABLE 7

Total R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2001–21

(Dollars in thousands)

FFRDC	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 ^a	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Pacific Northwest National Laboratory	562,000	608,500	679,000	692,370	779,522	749,365	851,512	885,984	1,064,230	1,116,648	1,095,923	1,033,768	934,491	1,021,912	951,099	914,747	983,962	956,193	1,012,136	1,071,249	1,168,268
Princeton Plasma Physics Laboratory	76,021	73,610	66,764	75,255	81,803	78,151	75,720	78,154	81,113	83,932	84,863	81,389	85,088	97,768	81,348	82,246	81,444	82,435	91,271	107,662	115,505
Project Air Force	29,361	32,439	33,555	33,049	35,742	39,107	39,315	41,794	45,162	43,957	44,171	41,031	36,003	39,351	44,393	49,165	48,521	48,858	48,325	46,936	47,966
Sandia National Laboratories	1,416,796	1,583,348	1,742,861	1,833,571	1,946,435	1,968,488	2,031,309	2,076,786	2,043,509	2,157,022	2,277,166	2,293,307	2,412,476	2,507,099	2,621,891	2,781,547	2,878,000	3,009,105	3,373,217	3,395,241	3,542,756
Savannah River National Laboratory	87,164	93,602	94,423	94,326	98,650	102,547	114,895	118,400	130,292	127,160	134,530	132,357	115,857	121,013	121,675	125,881	141,477	154,281	176,379	176,093	191,803
Science and Technology Policy Institute	7,311	8,878	6,710	3,681	5,415	6,800	5,600	6,000	5,100	6,000	8,700	7,547	5,010	10,949	8,724	7,459	8,401	8,086	9,080	9,256	9,784
SLAC National Accelerator Laboratory	145,979	171,343	164,747	206,402	205,690	214,026	231,960	234,316	294,421	354,393	327,716	329,747	327,005	316,646	310,167	313,031	327,453	341,615	368,938	382,264	396,780
Software Engineering Institute	37,052	45,088	45,412	57,920	62,262	75,636	80,566	80,963	89,077	99,334	107,837	113,371	134,973	123,217	131,146	145,981	132,967	142,891	140,954	141,291	120,443
Systems and Analyses Center	92,930	98,236	110,200	126,226	118,600	130,400	141,500	146,500	166,000	156,000	156,200	149,150	142,977	145,211	157,645	169,580	163,125	168,034	177,948	171,335	173,792
Thomas Jefferson National Accelerator Facility	102,202	106,305	106,966	104,659	113,349	96,228	81,242	82,254	88,834	90,456	90,456	94,167	100,031	105,868	128,036	120,009	107,320	118,631	125,796	130,850	139,479

e = estimated by institution. na = not applicable. NA = not available; data were not provided by institution.

FFRDC = federally funded research and development center; NSF = National Science Foundation.

^a R&D expenditures decreased in FY 2011 due to removal of expenditures for capital projects. In this survey, R&D expenditures do not include capital projects. In previous years, some FFRDCs included capital expenditures in their R&D totals. Previous years include an unknown amount of capital expenditures, estimated to be less than \$500 million per year.

^b Prior to FY 2014, the Aerospace Corporation reported only internal R&D projects. After discussion with the National Center for Science and Engineering Statistics, the Aerospace Corporation agreed to report all R&D expenditures for FY 2014 and provide revised data to include all R&D expenditures for FYs 2010–13.

^c Prior to the FY 2021 collection, the National Center for Science and Engineering Statistics discovered that the Green Bank Observatory had split from the National Radio Astronomy Observatory on 1 October 2016, both retained FFRDC status. For FYs 2017–20, R&D expenditures reported for National Radio Astronomy Observatory, include the expenditures for the Green Bank Observatory. The Green Bank Observatory began reporting separately on the FY 2021 survey.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

TABLE 8

Total and federally financed R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2018–21

(Dollars in thousands)

FFRDC	Total				Federally financed			
	2018	2019	2020	2021	2018	2019	2020	2021
All FFRDCs	21,171,529	22,737,500	23,514,241	24,921,476	20,770,388	22,338,855	23,133,501	24,509,691
University-administered FFRDCs	6,715,338	6,946,262	7,003,132	6,850,276	6,560,094	6,796,696	6,867,741	6,700,555
Ames Laboratory	36,858	33,612	32,844	34,214	35,696	33,211	32,302	34,016
Argonne National Laboratory	777,246	810,693	859,658	856,568	747,349	787,513	840,237	832,400
Fermi National Accelerator Laboratory	328,419	334,258	300,002	319,051	327,630	333,460	299,811	317,812
Green Bank Observatory ^a	NA	NA	NA	8,629	NA	NA	NA	8,629
Jet Propulsion Laboratory	2,733,908	2,709,063	2,638,412	2,388,355	2,733,908	2,709,063	2,638,412	2,388,355
Lawrence Berkeley National Laboratory	832,457	872,237	916,082	966,972	769,839	807,967	862,965	910,428
Lincoln Laboratory	1,013,320	1,103,870	1,115,927	1,136,133	1,001,849	1,084,953	1,093,081	1,110,465
National Center for Atmospheric Research	158,260	199,476	188,484	181,010	139,532	187,615	175,316	161,163
National Radio Astronomy Observatory	100,691	101,901	100,078	94,202	98,642	99,881	98,458	93,313
National Solar Observatory	14,733	15,931	16,892	17,684	14,027	15,892	16,472	17,680
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	33,874	38,262	72,686	75,251	24,172	28,760	69,685	73,393
Princeton Plasma Physics Laboratory	82,435	91,271	107,662	115,505	82,057	91,119	103,856	113,591
SLAC National Accelerator Laboratory	341,615	368,938	382,264	396,780	326,587	352,527	366,936	382,252
Software Engineering Institute	142,891	140,954	141,291	120,443	142,877	140,940	141,291	120,443
Thomas Jefferson National Accelerator Facility	118,631	125,796	130,850	139,479	115,929	123,795	128,919	136,615
Nonprofit-administered FFRDCs	6,617,274	7,033,162	7,419,509	8,370,508	6,490,564	6,891,730	7,279,066	8,215,876
Aerospace Federally Funded Research and Development Center	1,020,827	1,065,989	1,114,741	1,128,241	1,018,425	1,062,804	1,109,291	1,121,569
Arroyo Center	39,738	37,956	35,248	38,304	39,738	37,956	35,248	38,304
Brookhaven National Laboratory	552,640	590,470	595,466	637,658	525,170	561,030	569,925	620,000
Center for Advanced Aviation System Development	177,530	174,123	180,634	230,484	156,437	152,539	163,497	207,828
Center for Communications and Computing	68,237	68,371	67,072	65,255	68,237	68,371	67,072	65,255
Center for Enterprise Modernization	162,690	174,712	190,408	263,661	161,448	173,127	190,408	263,661
Center for Naval Analyses	95,198	96,697	95,874	96,391	95,198	96,697	95,874	96,391
Center for Nuclear Waste Regulatory Analyses	5,054	6,987	6,762	5,630	4,647	6,340	6,359	5,233
CMS Alliance to Modernize Healthcare	175,030	213,369	228,162	348,269	175,030	213,369	228,162	348,269
Homeland Security Operational Analysis Center	46,321	54,751	44,736	34,888	46,321	54,751	44,736	34,888
Homeland Security Systems Engineering and Development Institute	104,689	115,813	136,874	183,588	104,689	115,813	135,713	182,413
Judiciary Engineering and Modernization Center	6,697	7,331	6,765	5,493	6,697	7,331	6,708	5,493
National Biodefense Analysis and Countermeasures Center	37,598	39,003	42,330	44,968	37,598	39,003	42,330	44,968

TABLE 8

Total and federally financed R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2018–21

(Dollars in thousands)

FFRDC	Total				Federally financed			
	2018	2019	2020	2021	2018	2019	2020	2021
National Cybersecurity Center of Excellence	19,556	22,205	23,557	33,671	19,556	22,205	23,557	33,671
National Defense Research Institute	57,743	67,647	64,134	66,170	57,743	67,647	64,134	66,170
National Renewable Energy Laboratory	388,500	455,016	511,585	559,151	349,410	405,923	456,336	497,047
National Security Engineering Center	1,078,610	1,124,861	1,143,701	1,468,298	1,077,697	1,123,616	1,142,013	1,463,965
Oak Ridge National Laboratory	1,399,445	1,470,372	1,632,684	1,760,578	1,378,398	1,454,122	1,616,580	1,746,756
Pacific Northwest National Laboratory	956,193	1,012,136	1,071,249	1,168,268	943,147	993,733	1,053,982	1,142,925
Project Air Force	48,858	48,325	46,936	47,966	48,858	48,325	46,936	47,966
Science and Technology Policy Institute	8,086	9,080	9,256	9,784	8,086	9,080	9,256	9,784
Systems and Analyses Center	168,034	177,948	171,335	173,792	168,034	177,948	170,949	173,320
Industry-administered FFRDCs	7,838,917	8,758,076	9,091,600	9,700,692	7,719,730	8,650,429	8,986,694	9,593,260
Frederick National Laboratory for Cancer Research	748,500	751,452	745,726	861,605	748,500	751,452	745,726	861,605
Idaho National Laboratory	395,112	478,324	494,094	516,691	376,053	463,588	481,146	503,977
Lawrence Livermore National Laboratory	1,386,687	1,517,429	1,558,071	1,613,673	1,353,502	1,480,978	1,526,467	1,580,263
Los Alamos National Laboratory	2,145,232	2,461,275	2,722,375	2,974,164	2,120,857	2,440,514	2,701,388	2,950,380
Sandia National Laboratories	3,009,105	3,373,217	3,395,241	3,542,756	2,967,822	3,340,658	3,358,481	3,507,607
Savannah River National Laboratory	154,281	176,379	176,093	191,803	152,996	173,239	173,486	189,428

NA = not available; data were not provided by institution.

FFRDC = federally funded research and development center; NSF = National Science Foundation.

^a Prior to the FY 2021 collection, the National Center for Science and Engineering Statistics discovered that the Green Bank Observatory had split from the National Radio Astronomy Observatory on 1 October 2016, both retained FFRDC status. For FYs 2017–20, R&D expenditures reported for National Radio Astronomy Observatory, include the expenditures for the Green Bank Observatory. The Green Bank Observatory began reporting separately on the FY 2021 survey.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

Technical Notes

Survey Overview

Purpose. The Federally Funded Research and Development Center (FFRDC) Research and Development Survey is conducted by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF). It is the primary source of information on separately accounted for R&D expenditures at FFRDCs in the United States.

Data collection authority. The information is solicited under the authority of the NSF Act of 1950, as amended, and the American COMPETES Reauthorization Act of 2010. The Office of Management and Budget control number for the FY 2021 FFRDC R&D Survey is 3145-0100, with an expiration date of 31 August 2022.

Survey contractor. ICF.

Survey sponsor. NCSES.

Key Survey Information

Frequency. Annual.

Initial survey year. 2001.

Reference period. FY 2021.

Response unit. Establishment.

Sample or census. Census.

Population size. 43.

Sample size. Not applicable. The survey is a census of all known eligible FFRDCs.

Survey Design

Target population. All FFRDCs.

Sampling frame. The total survey universe is identified through the NSF Master Government List of FFRDCs (<https://www.nsf.gov/statistics/ffrdclist/>). NSF is responsible for maintaining this list and queries all federal agencies annually to determine any changes to, additions to, or deletions from the list.

Sample design. The FFRDC R&D Survey is a census of all eligible organizations.

Data Collection and Processing Methods

Data collection. The FY 2021 survey announcements were sent by e-mail to all FFRDCs in November 2021. The data collection period concluded in March 2022. Respondents could choose to complete a questionnaire downloaded from the Web or use a Web-based data collection system to respond to the survey. Every effort was made to maintain close contact with respondents to preserve the consistency and continuity of the resulting data. Survey data reports were available on the survey website for each institution; these reports showed comparisons between the current year and the 2 prior years of data and noted any substantive disparities.

Respondents were asked to explain significant differences between current and past year reporting upon the submission of their surveys. Questionnaires were then carefully examined by survey staff. Reviews focused on unexplained missing data and explanations provided for changes in reporting patterns. If additional explanations or data revisions were needed, respondents were sent personalized e-mails asking them to provide any necessary revisions before the final processing and tabulation of data. Respondents were encouraged to correct prior year data, if necessary. When respondents updated or amended figures from past years, NCSSES made corresponding changes to trend data in the 2021 data tables and to the underlying microdata. For accurate historical data, use only the most recently released data tables.

Mode. Respondents could respond to the survey by completing an Adobe PDF questionnaire downloaded from the Web or by using a Web-based data collection system. All FFRDCs submitted data using the Web-based survey.

Response rates. All 43 FFRDCs included on the NSF Master Government List of FFRDCs during the FY 2021 survey cycle completed the key survey questions.

Data editing. The FFRDC R&D Survey was subject to very little editing; respondents were contacted and asked to resolve possible self-reporting issues themselves. Questionnaires were carefully examined by survey staff upon receipt. These reviews focused on unexplained missing data and explanations provided for changes in reporting patterns. If additional explanations or data revisions were needed, respondents were sent personalized e-mail messages asking them to provide any necessary revisions before the final processing and tabulation of data.

Imputation. No data were imputed for FY 2021.

Weighting. FFRDC R&D Survey data were not weighted.

Variance estimation. No variance estimation techniques were used.

Survey Quality Measures

Sampling error. Because the FY 2021 survey was a survey distributed to all organizations in the universe, there was no sampling error.

Coverage error. Because of the availability of a comprehensive FFRDC list, there is no known coverage error for this survey. FFRDCs are identified through the NSF [Master Government List of FFRDCs](#). NSF is responsible for maintaining the master list and queries all federal agencies annually to determine changes to, additions to, or deletions from the list.

Nonresponse error. Most FFRDCs have incorporated the data needed to complete most of the survey questions into their record-keeping systems. Twelve FFRDCs chose not to complete Question 5 of the survey, which asks for expenditures by type of cost. Eleven of those FFRDCs are managed by private companies for whom salary information is considered proprietary. One FFRDC, which is managed by a university, does not capture direct and indirect costs in their financial system in a way that is reportable on Question 5. Other FFRDCs did not answer all sections of Question 5: two FFRDCs could not provide information on software expenditures, and four could not provide data on equipment expenditures. One FFRDC did not report its operating budget (Question 6). One FFRDC could not provide expenditures funded by nonprofit organizations separately from those funded by businesses (Question 1); the combined amount was reported as business funded.

Measurement error. NCSSES discovered during the FY 2011 survey cycle that seven FFRDCs were including capital project expenditures in the R&D totals reported on the survey. Corrections made for the FY 2011 survey cycle lowered total expenditures by \$468 million. However, previous years still include an unknown amount of capital expenditures in the total. The amount is estimated to be less than \$500 million per year.

Prior to the FY 2011 survey, the five FFRDCs administered by the MITRE Corporation had reported only internally funded R&D expenditures. After discussions with NCSSES, these five FFRDCs agreed to report all FY 2011 operating expenditures for R&D and to revise their data for FYs 2008–10.

NCSES discovered during the FY 2013 survey cycle that Los Alamos National Laboratory (LANL) was reporting some expenditures that were not for R&D, as defined by this survey. Corrections made for the FY 2013 survey cycle lowered the laboratory's total expenditures by \$349 million. LANL also incorrectly was reporting that all expenditures were for basic research. In corrections made for FY 2013, LANL reported that \$1,554 million (91%) of its total research expenditures was for applied research. LANL data from previous years still include an unknown amount of expenditures that were not for R&D and categorize all expenditures as basic research.

Prior to FY 2014, the Aerospace FFRDC reported only expenditures on internal R&D projects. After discussions with NCSES, the Aerospace Corporation agreed to report all R&D expenditures for FY 2014 and provide revised data to include all R&D expenditures for FYs 2010–13. R&D expenditures increased by more than \$800 million each year.

During the FY 2014 survey, NCSES discovered that the National Optical Astronomy Observatory had been including data for the National Solar Observatory since FY 2010. The Association of Universities for Research in Astronomy, the administrator of both FFRDCs, provided revised data for both FFRDCs for FYs 2010–13.

During the FY 2016 survey, NCSES discovered that the Judiciary Engineering and Modernization Center was incorrectly classified as an industry-administered FFRDC in FYs 2011–15. This FFRDC is administered by the MITRE Corporation, a nonprofit organization, and should have been classified as a nonprofit-administered FFRDC. The classification was corrected for FY 2016, and the Judiciary Engineering and Modernization Center's FYs 2011–15 data were reclassified as coming from a nonprofit-administered FFRDC.

Prior to the FY 2021 collection, NCSES discovered that the Green Bank Observatory had split from the National Radio Astronomy Observatory on 1 October 2016, both retained FFRDC status. For FYs 2017–20, R&D expenditures reported for the National Radio Astronomy Observatory, include the expenditures for the Green Bank Observatory. The Green Bank Observatory began reporting separately on the FY 2021 survey.

Data Comparability (Changes)

Annual data are available for all FFRDCs for FYs 2001–21. When the review for consistency between each year's data and submissions in prior years reveals discrepancies, it is sometimes necessary to modify prior years' data. For accurate historical data, use only the most recently released data tables. Individuals wishing to analyze trends other than those in the most recent NCSES publication are encouraged to contact the Survey Manager for more information about the comparability of data over time.

Changes in survey coverage and population. Most years, there are some changes to the FFRDC population that may affect trend analyses. FFRDCs have been created, decertified, renamed, or restructured, as described below:

- On 20 December 2006, the National Biodefense Analysis and Countermeasure Center was created.
- Prior to FY 2009, the Center for Enterprise Modernization was listed as the Internal Revenue Service FFRDC.
- On 5 March 2009, the Homeland Security Studies and Analysis Institute and the Homeland Security Systems Engineering and Development Institute were created. These new FFRDCs replaced the Homeland Security Institute.
- On 1 October 2009, the National Solar Observatory split from the National Optical Astronomy Observatory, with both retaining their FFRDC status.
- On 2 September 2010, the Judiciary Engineering and Modernization Center was created.
- Prior to FY 2011, the National Security Engineering Center was listed as C3I FFRDC.
- On 1 October 2011, the National Astronomy and Ionosphere Center was decertified as an FFRDC.
- Prior to FY 2012, the Frederick National Laboratory for Cancer Research was listed as the National Cancer Institute at Frederick.

- On 27 September 2012, the Centers for Medicare and Medicaid Services FFRDC was created. On 15 August 2013, its name was changed to the CMS Alliance to Modernize Healthcare.
- Prior to FY 2013, the Systems and Analyses Center was listed as the Studies and Analyses Center.
- On 19 September 2014, the National Cybersecurity Center of Excellence was created.
- On 15 September 2016, the Homeland Security Operational Analysis Center was created.
- On 1 October 2016, Green Bank Observatory was split out from the National Radio Astronomy Observatory, both retained FFRDC status.
- The Homeland Security Studies and Analysis Institute was phased out on 31 October 2016.
- In June 2020, the National Optical Astronomy Observatory changed its name to NSF's National Optical-Infrared Astronomy Research Laboratory or NSF's NOIRLab.

Changes in questionnaire. FFRDCs are asked to provide R&D expenditures by source of funding and type of R&D. In FY 2016, NCSSES added a question (Question 2) asking for R&D expenditures funded by seven specific federal agencies. In FY 2019, NCSSES added a question (Question 3) asking which federal agencies funded the expenditures reported under Other federal agencies in Question 2.

Changes in reporting procedures or classification. The FFRDC R&D Survey has been conducted annually for university-administered FFRDCs since FY 1953 and for all FFRDCs since FY 2001.

Definitions

- *Expenditures by federal agency.* In Question 2, FFRDCs were asked for the amount of R&D expenditures by federal funding agency. FFRDCs were asked to report expenditures funded by seven specific agencies (Department of Defense; Department of Energy; Department of Health and Human Services, including the National Institutes of Health; Department of Homeland Security; Department of Transportation; National Aeronautics and Space Administration; and National Science Foundation). Any expenditures funded by other federal agencies were reported under Other federal agencies. In Question 3, FFRDCs were asked to list the specific agencies and corresponding expenditures included in Other federal agencies.
- *Expenditures by source.* In Question 1, FFRDCs were asked to report their total R&D expenditures by funding source, as defined below:
 - *U.S. federal government.* Any agency of the U.S. government. Federal funds that were passed through to the reporting institution from another institution were included.
 - *State and local government.* Any state, county, municipality, or other local government entity in the United States, including state health agencies.
 - *Business.* Domestic or foreign for-profit organizations. Funds from a company's nonprofit foundation were not reported here; they were reported under Nonprofit organizations.
 - *Nonprofit organizations.* Domestic or foreign nonprofit foundations and organizations.
 - *All other sources.* Sources not reported in other categories, such as funds from foreign governments.
- *Expenditures by type of cost.* In Question 5, FFRDCs were asked for expenditures by type of cost, as defined below:
 - *Salaries, wages, and fringe benefits.* Included compensation for all R&D personnel, whether full time or part time, temporary or permanent, including salaries, wages, and fringe benefits paid from institution funds and from external support.
 - *Software purchases.* Included payments for all software, both purchases of software packages and license fees for systems.

- *Equipment*. Included payments for movable equipment, including ancillary costs such as delivery and setup.
- *Subcontracts*. Payments to subcontractors or subrecipients for services on R&D projects.
- *Other direct costs*. Other costs that did not fit into one of the above categories, including (but not limited to) travel, computer usage fees, and supplies.
- *Indirect costs*. Included all indirect costs (overhead) associated with R&D projects.
- *Expenditures by type of R&D*. In Question 4, FFRDCs were asked for the amount of federal and nonfederal R&D expenditures by type of R&D, as defined below:
 - *Basic research*. Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
 - *Applied research*. Original investigation undertaken to acquire new knowledge. It is directed primarily toward a specific, practical aim or objective.
 - *Experimental development*. Systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.
- *Fiscal year*. FFRDCs were asked to report data for their fiscal year (or financial year).
- *R&D*. The FFRDC R&D Survey requested data from FFRDCs on their R&D, defined as systematic study directed toward fuller knowledge or understanding of the subject studied. R&D included basic research, applied research, and experimental development (see *Expenditures by type of R&D* above for additional information). R&D did not include outreach or nonresearch training programs. Respondents were also asked to exclude capital projects (i.e., construction or renovation of research facilities) from reported expenditures.
- *R&D expenditures*. FFRDCs were asked to report all current operating expenditures for activities specifically organized to produce R&D outcomes, including those funded by external sponsors or separately budgeted and accounted for by the organization using internal funds. Expenditures included indirect costs, equipment, software, clinical trials, and subcontract expenditures.
- *Total operating budget*. Total executed operating budget for the FFRDC excluding capital construction costs.

Acknowledgments and Suggested Citation

Acknowledgments

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